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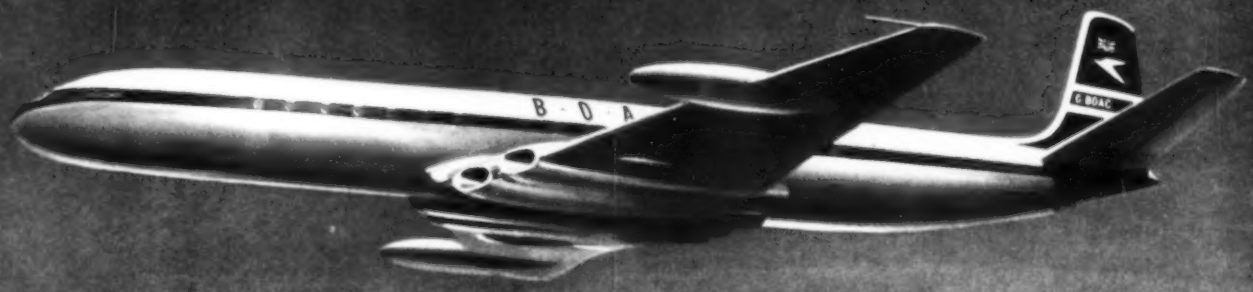

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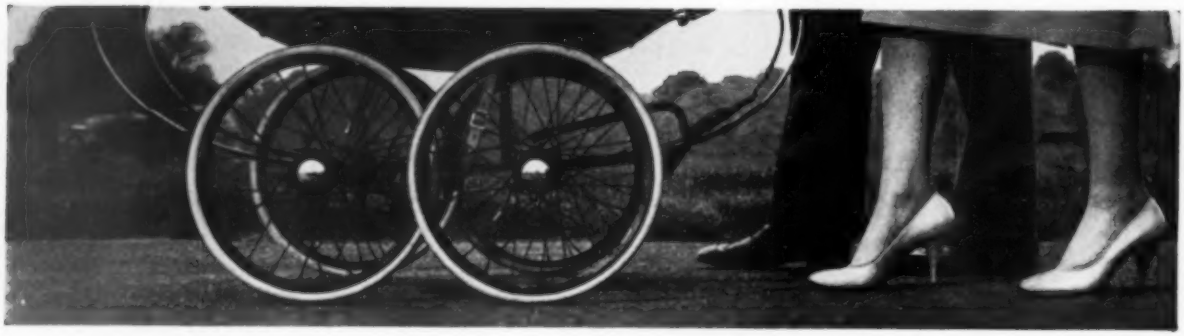
oh, do stop nattering about Nylocs . . .



Give it a rest, George. It's Saturday,
we're taking a brand new baby out in a brand new pram . . .
and all you can talk about is stupid old nuts.

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Can't you talk about something interesting?

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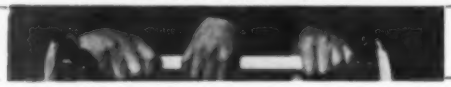
George, please! All you ever do is talk!
Even your son and heir is bored to tears. He'd be a lot happier if you forgot about Nylocs.



That's just where you're wrong—he wouldn't be. See those things on the pram hood . . .

All right, don't tell me—they're Nylocs!
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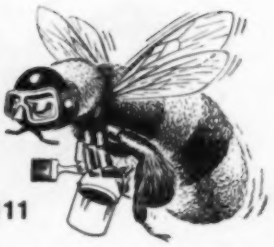

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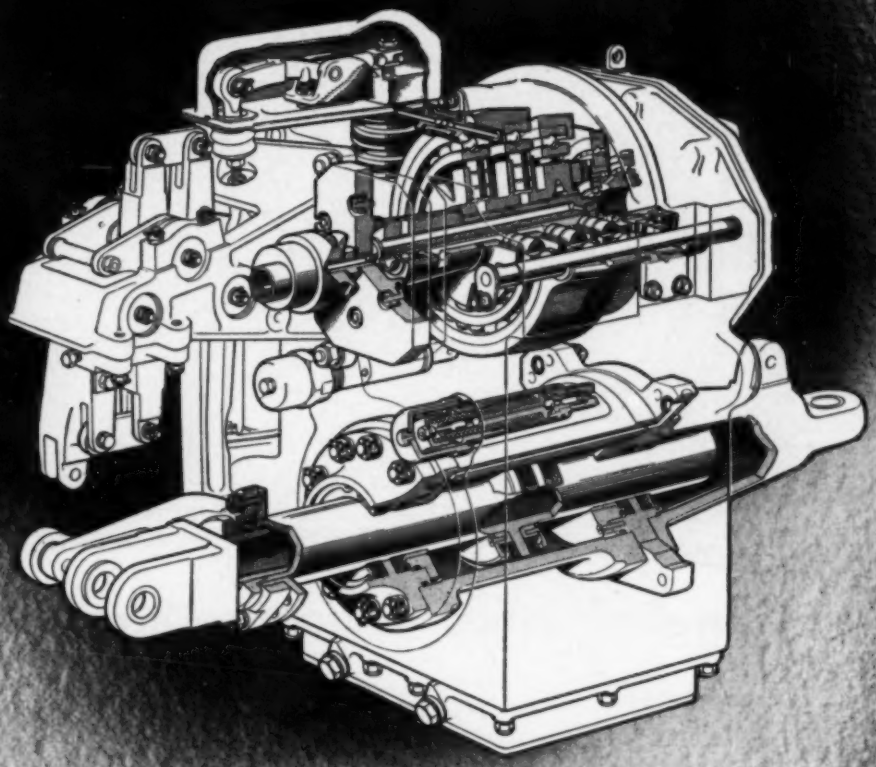

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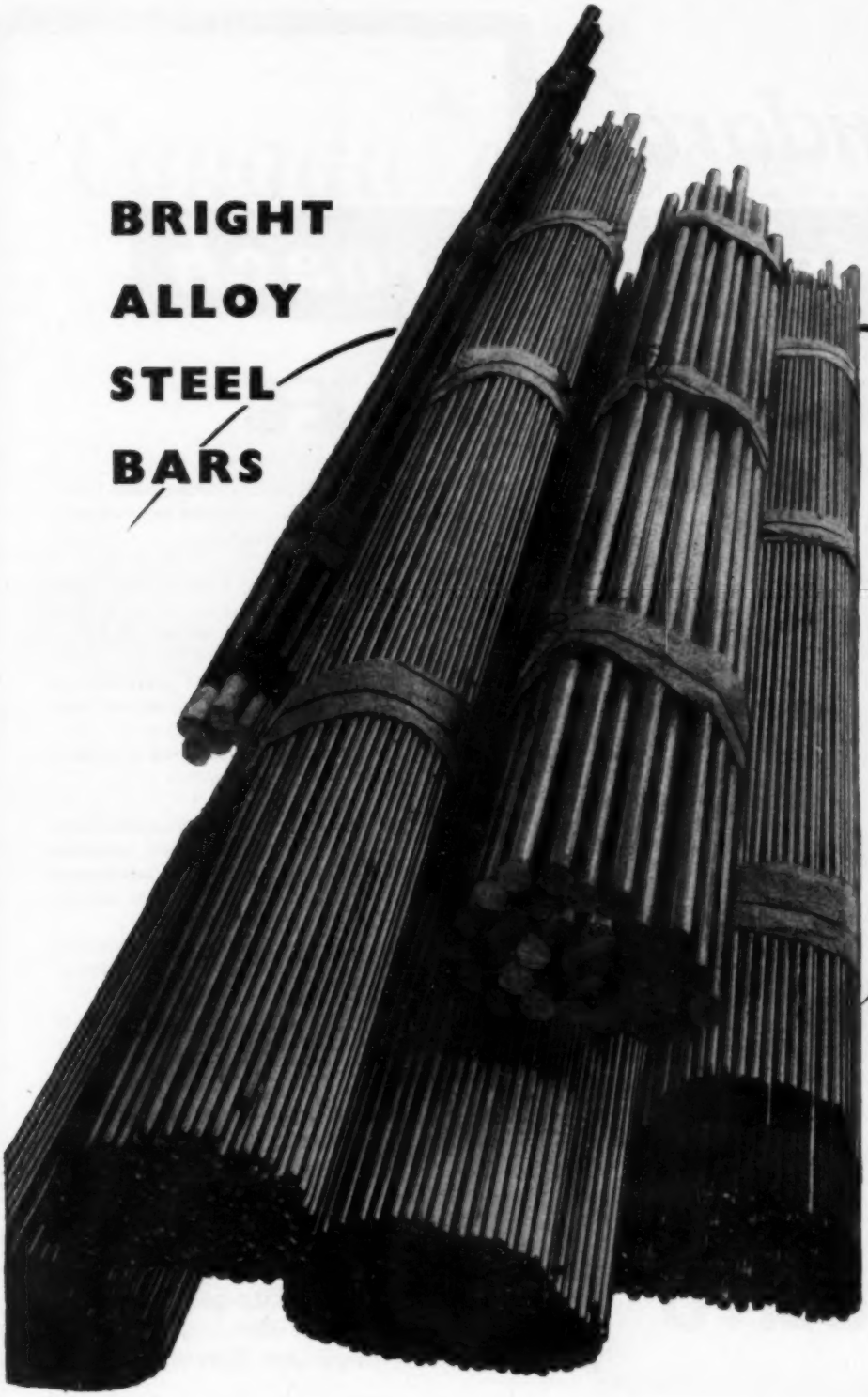

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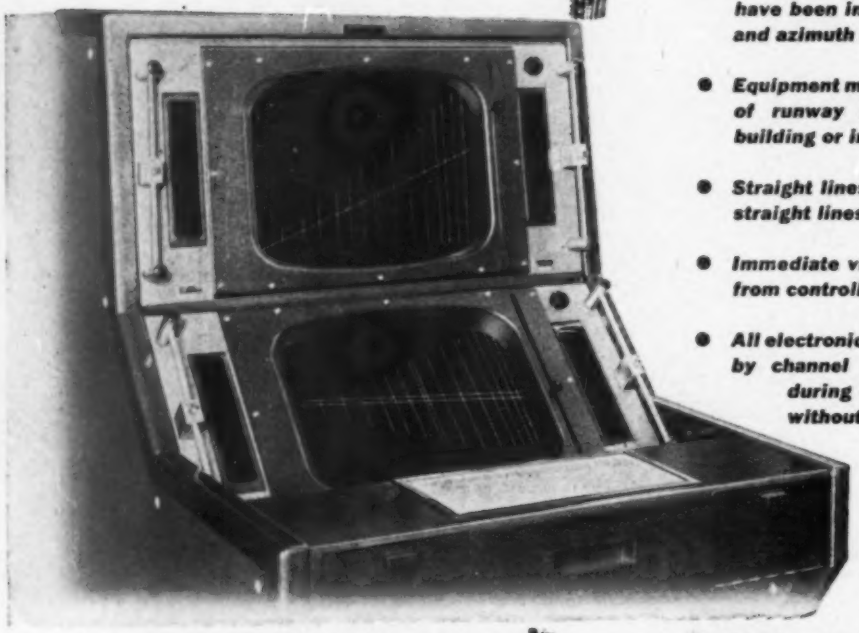

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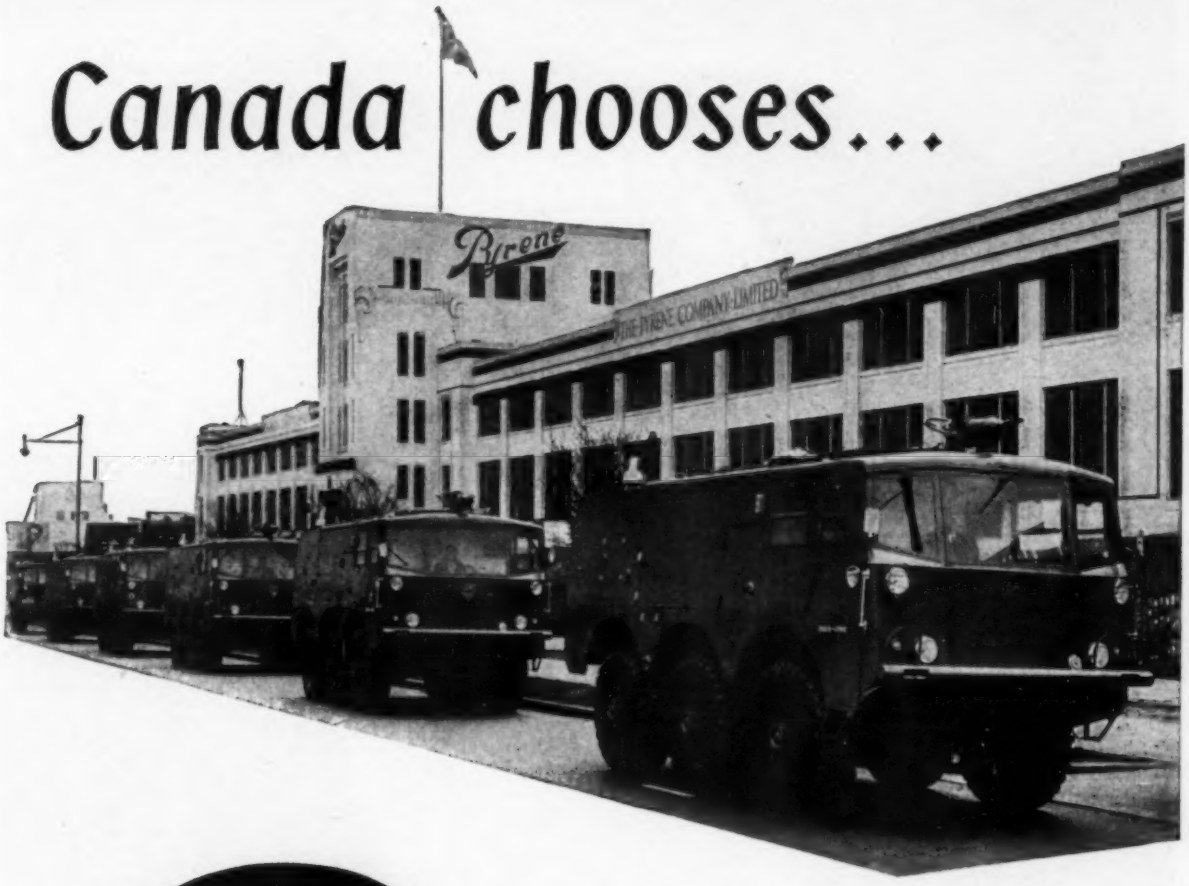

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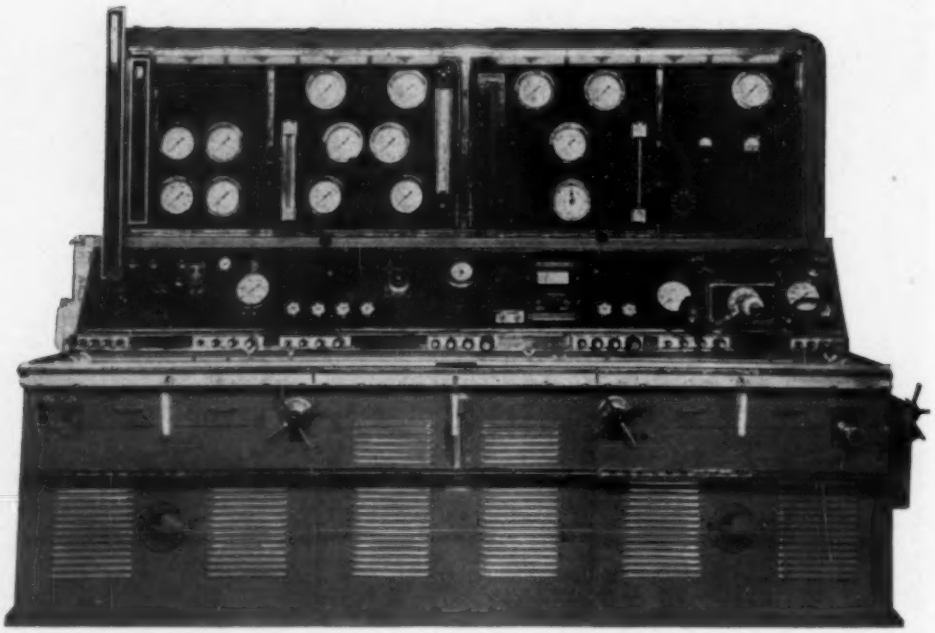

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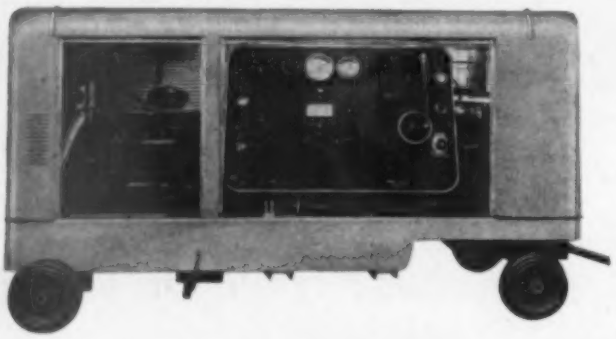

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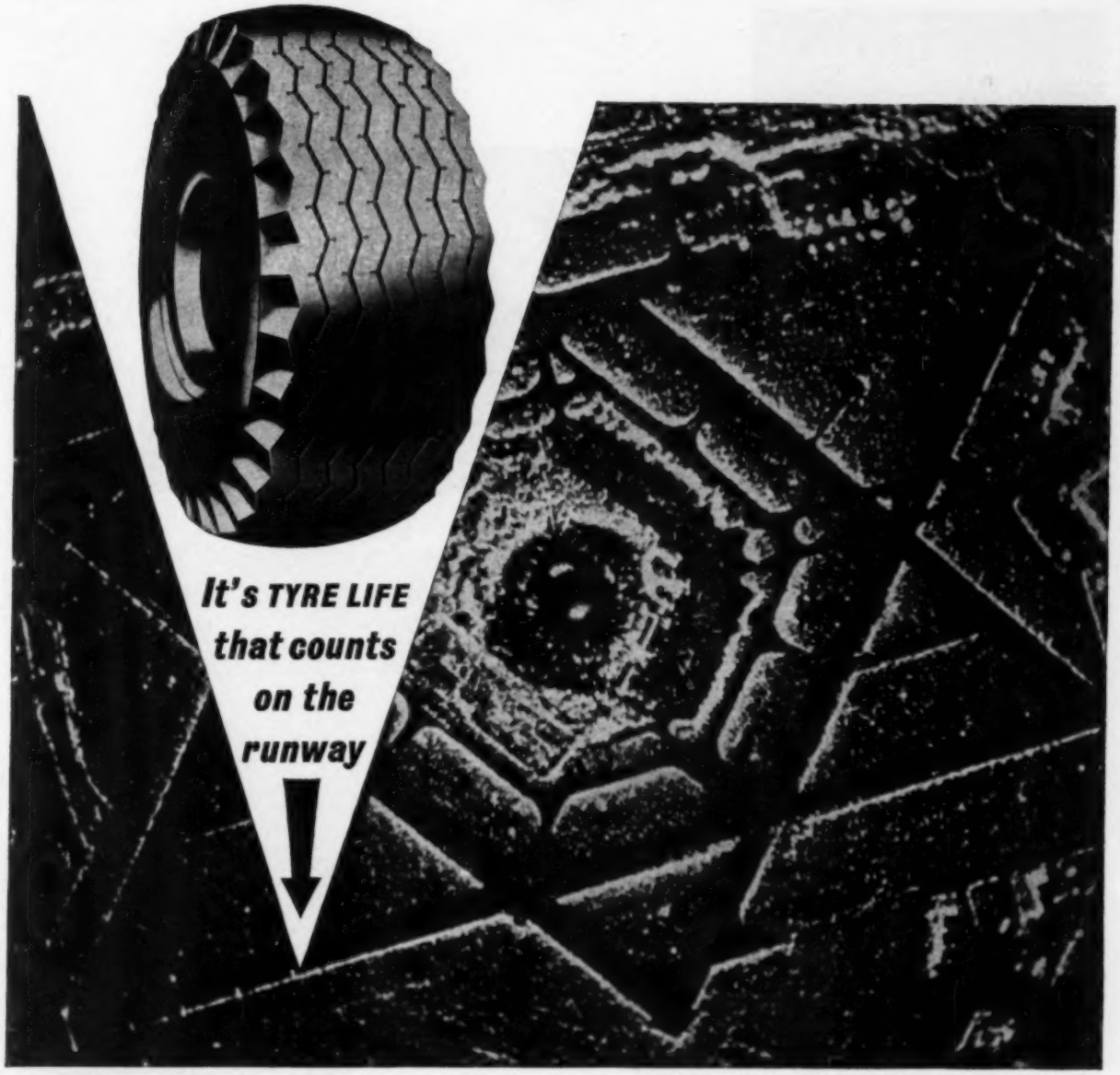

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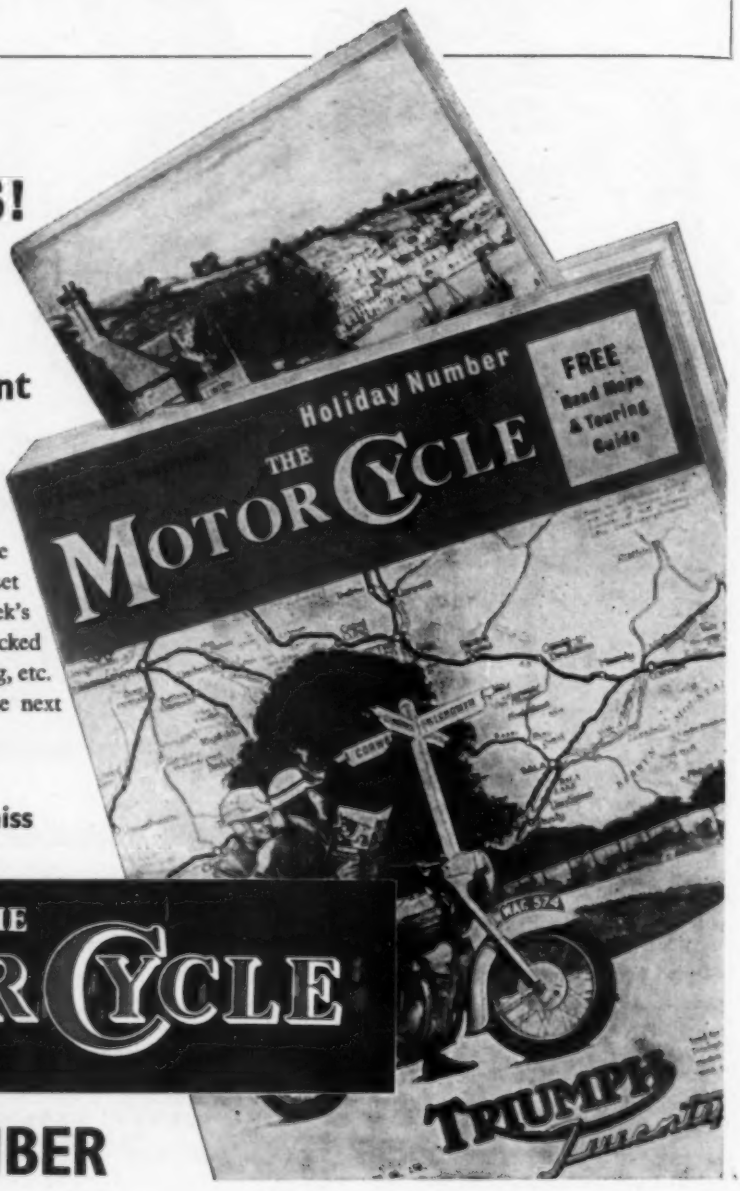

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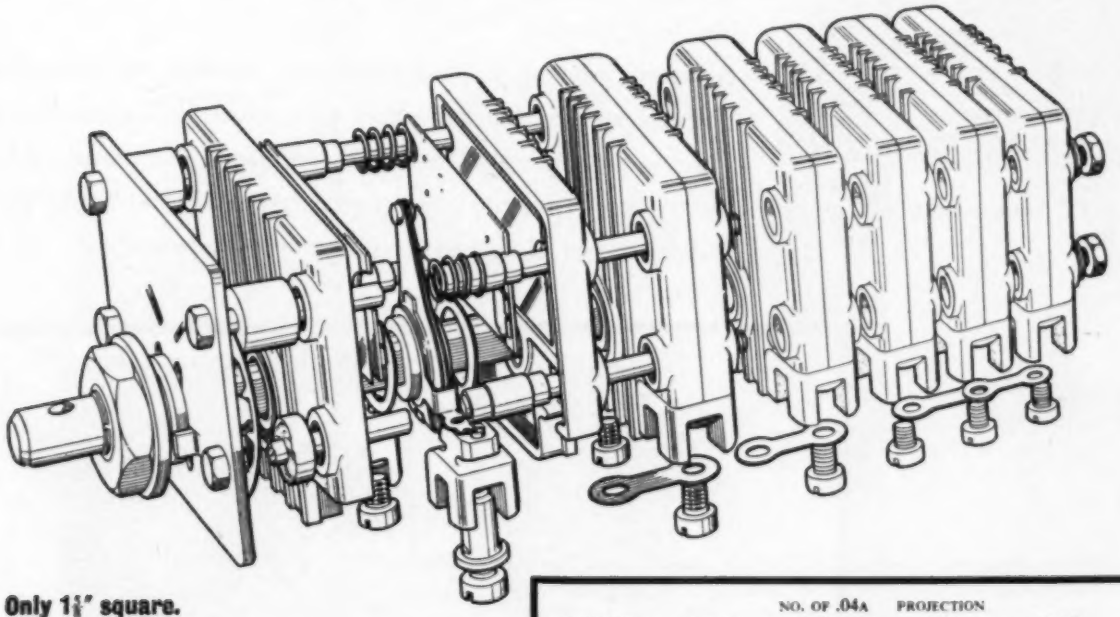

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100	1	11 — 16	1.175	80/10/0941
75	2	17 — 23	1.575	80/10/0926
50	2	24 — 31	1.575	80/10/0935
33	3	32 — 50	2.075	80/10/0942
2 × 600	2	2 × 2	1.575	80/10/0949
2 × 300	2	2 × 3 — 5	1.575	80/10/0947
2 × 150	2	2 × 6 — 10	1.575	80/10/0936
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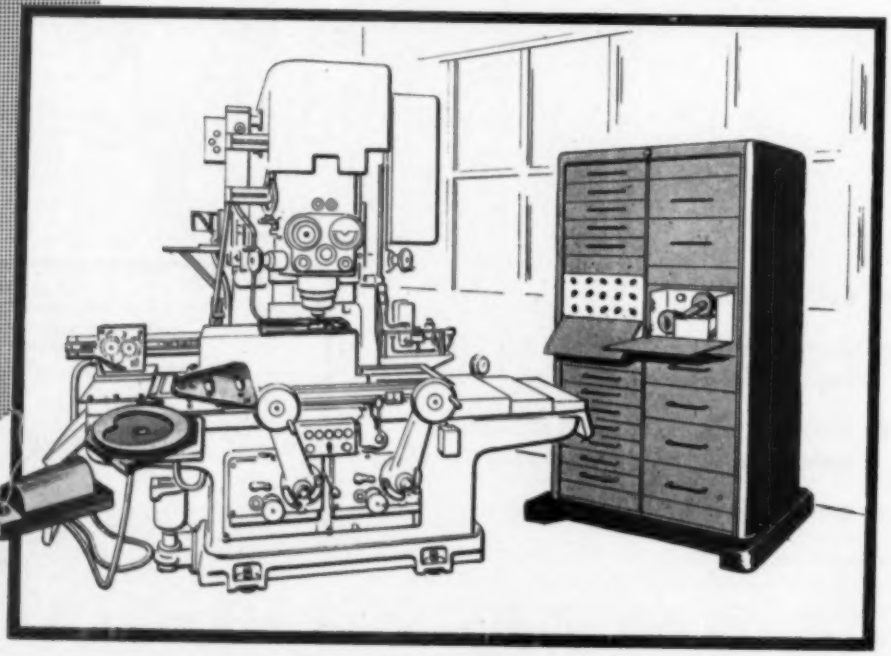

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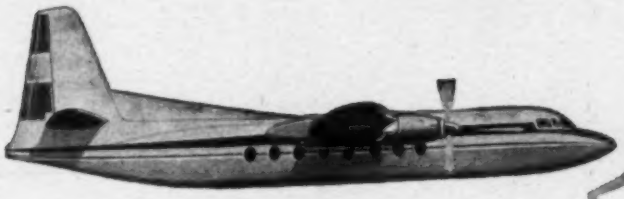

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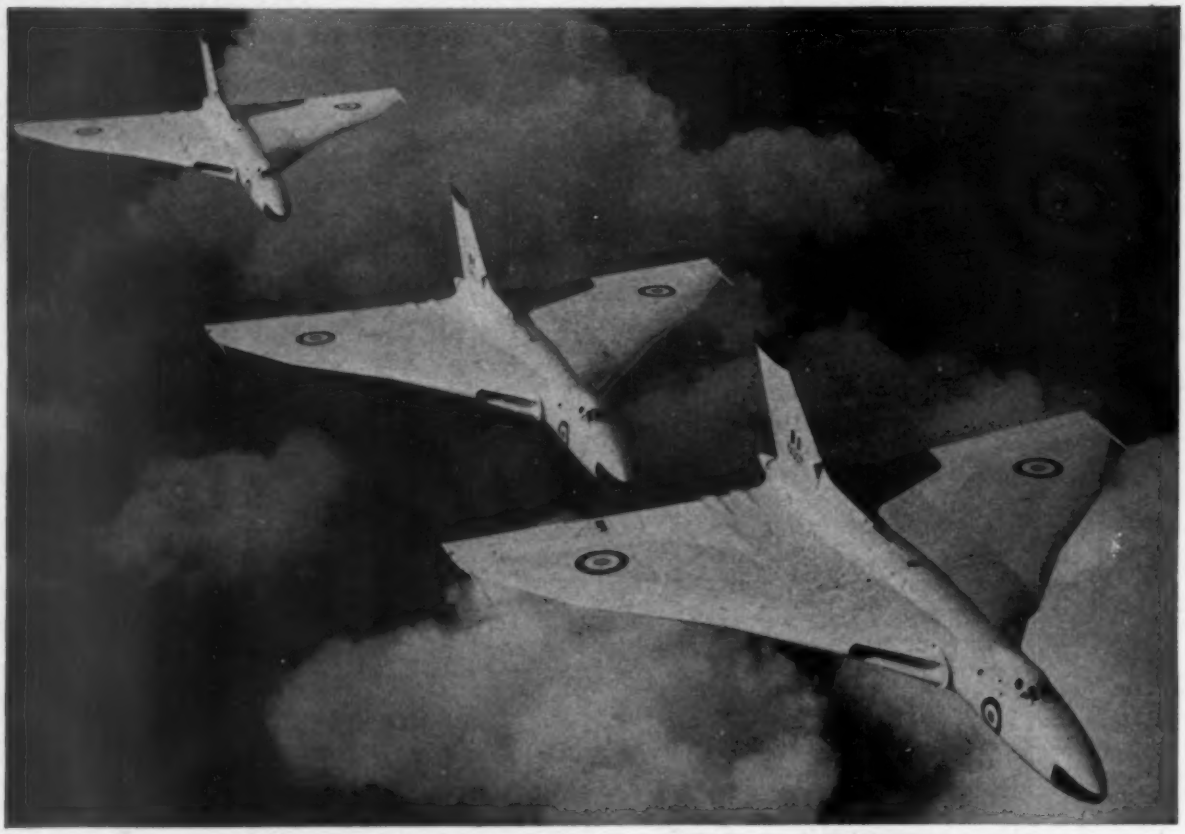

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FLIGHT
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AIRCRAFT ENGINEER

No 2569 Vol 73 FRIDAY 18 APRIL 1958

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A Force for Good

THE paramount objective of world air transport, the industry to which this special number of *Flight* is devoted, can be summed up in one word—expansion. No one will deny that this is the right objective. There may be doubts that expansion is being accomplished in the most economic way: but the economists will agree with the humanists that, as a force for good in a missile-threatened world, air transport is one of man's more inspiring activities.

Upon the fulcrum of aviation is indeed balanced the future of the world. If man will bend his energies to the expansion of airlines rather than to the construction of missile-arsenals, the late Dr. Plesman's "ideal goal" for aviation—unity of the nations—will be attained. The alternative, the pessimists say, is that our planet will become a radioactive charnel-house.

But we would be fooling ourselves if we believed that the motivating force behind the airlines' expansion is consciously altruistic. It is not; and if the growth of air transport is not wisely regulated its expansion may be politically and financially disappointing. Two trends in particular, which might be described as the competitive pressures of quality and sovereignty, should be carefully watched.

Quality-competition (where "quality," in fixed-price conditions, means speed and non-stop range performance) and sovereignty manifest themselves in two basic ways. First, the technologies of propulsion and aerodynamics are not being allowed to flourish as they should in the field of low operating cost. Second, the airlines are tending to spread their business too thinly, and are expanding extensively instead of intensively.

There will, perhaps, be a move within the International Air Transport Association to assuage the competitive consequences of its rigid price-fixing policies. At its September 1958 fares conference in Cannes the seed of the fare-differential may be sown. This new concept of airline prices (discussed on pages 520 and 521 of this issue) will be bitterly opposed, but its logic must eventually be recognized. No one can prove that the new jets will be more costly to operate than their contemporary turboprops; but no one can convincingly show that the new jets will achieve what aviation technology has always made possible in the past—a reduction in the general level of operating cost.

The fare-differential will not arrest technological development, but it will attract the attention of technology to a demand for low cost transport, free from quality-competition; it will mean that the operating industry will not have to clean out its pockets every time there is a technological revolution (the next one will bring supersonic transports); and it will be the fertilizer of an air transport growth rooted in low fares.

If it is accepted that the industry must expand, then it must be accepted that the major requirement for increasing the traffic volume is a reduction of the fare. The only way to reduce fares is to reduce the costs. The U.S. airline industry, having over-mortgaged itself in the quality-competition race, now wants fare increases of 15 to 20 per cent to pay for its new equipment. It is ironical that, in so doing, it may well be taking the first steps towards rendering that equipment useless, because the traffic to fill the new big-capacity transports can only be generated by a lowering of fares. This is the consequence of quality-competition, and the airlines may wish to create for themselves the conditions in which such a crisis cannot occur again.

The next year may also see a relaxation of emphasis on the concept of sovereignty. The idea that international air transport should be a sort of free-for-all ("multilateral liberalism" is the approved catchphrase) is as likely to retard economic progress as is over-jealously guarded sovereignty. The International Civil Aviation Organization has an important advisory rôle to play here: governments should be advised that the "me too" approach to air transport does not always help to increase the load-tons per route-mile—the parameter which, with load factor, is the index of air transport's economic health.

If the industry can master these weaknesses its future is hopeful indeed.

SPACE-AGE THEME was developed by the Duke of Edinburgh in his introductory talk to the Air League's conference, reported on this page. In the background are Sir Arnold Hall and Mr. A. C. Clarke.

FROM ALL QUARTERS

Rotodyne Hurdle Crossed

ON April 10, the prototype Fairey Rotodyne successfully achieved conversion from helicopter to autogyro flight, thus marking the completion of the first—and possibly most difficult—phase in its flight development. Conversion involves switching the power from the rotor to the propellers, the aircraft thereafter proceeding under the thrust of the latter, supported by its wing and free-wheeling rotor. Fairey comment that in cruising flight in this condition the aircraft is extremely quiet.

Pilot on the first fully-representative translational flight was Ron Gellatly, chief helicopter test pilot to the company. The Rotodyne first flew on November 6, 1957, and conversion took place on the 71st flight, at an altitude of 4,000ft. Throughout these tests the aircraft has been based at White Waltham, and it has previously made numerous cross-country flights operating in the helicopter regime.

Polaris Progress

IT was disclosed by the U.S. Navy on April 11 that the submarine-launched IRBM Polaris (for which the system manager is Lockheed Aircraft's Missile Systems Division) has made remarkable progress in recent months. Ciné films were publicly screened showing trials with a "pop-up" launcher—apparently a kind of buoyant cylinder—which fires the missile out of the water so that the rocket sustainer can be ignited in the air. The test vehicles used were not fitted with sustainers and so fell back after reaching about 100ft. Below are pictured a mock-up Polaris and a test with a land-based launcher.

Space-Age Discussion

ORGANIZED by the Air League of the British Empire, a discussion under the title *Britain Enters the Space Age* was held at the Royal Festival Hall, London, on Monday last, April 14. In his opening address the Duke of Edinburgh, patron of the Air League, said that the object of the meeting was to establish just what were the facts of space-flight, and to hear expert opinion on how space travel might develop in the future. "To inquire, to find out, to have a look round the next corner, has always been a characteristic of the human race," Prince Philip said, "and this characteristic is most unlikely to wither just at this moment of history, when the first steps into another unknown have just been taken."

Specialist speakers were next introduced by Marshal of the R.A.F. Sir Dermot Boyle, Chief of the Air Staff and chairman of the meeting. Prof. W. H. McCrea of London University discussed the place of space travel in current scientific and technological developments; Mr. J. E. Pateman of Elliott Brothers (London), Ltd., spoke on the problems of navigation in outer space; Mr. D. G. King-Hele of R.A.E. Farnborough described the existing satellites, their observation and the information gained from them; and Mr. A. C. Clarke commented on the future cultural and social aspects of space travel. The final item consisted of answers from a panel of experts (comprising the above speakers and Prof. H. S. W. Massey of University College, London, with Sir Arnold Hall as chairman) to a variety of questions from the audience.

Proteus at 1,300 Hours

ON March 19, Bristol Aero-Engines, Ltd., were authorized by the A.R.B. to increase allowable overhaul life of the Proteus 705 turboprop from 1,050 to 1,300 hr. The free-turbine Proteus is the most powerful engine in airline service in the Western world, with ratings between 3,900 and 4,150 e.h.p. It entered service on February 1 last year on a 500-hr basis, and accumulated 175,000 engine flight hours between then and the introduction of the latest schedule. Last month 16,000 hr were flown on B.O.A.C. routes, and the six premature removals experienced represent one in 2,700 hr.

The F8U-2

TWO development versions of the Chance Vought F8U-2 Crusader are now flying. Powered by the more powerful Pratt and Whitney J57-P-16 turbojet, this version has improved fire control and radar and can be distinguished by a pair of small ventral stabilizing fins and air scoops for afterburner and nozzle cooling. Production deliveries will start in September.

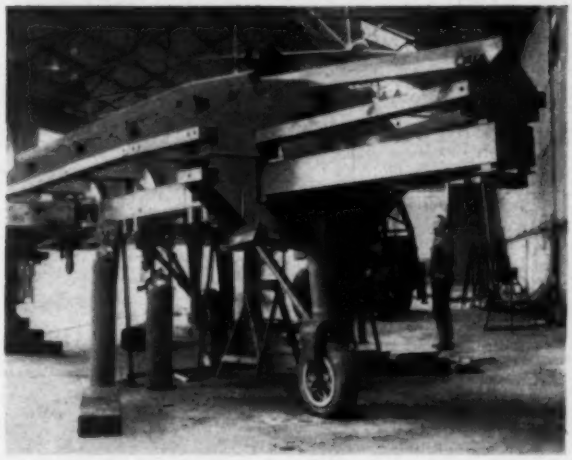
The F8U-2 should not be confused with the largely redesigned F8U-3, which is in competition with the McDonnell F4H. Reported to cost—in its development versions at least—the remarkable sum of $9m (£3,535,000) each, the -3 version has a J75 engine supplemented by an inbuilt rocket motor. All-weather fire control is expected to account for half the cost of each -3 machine.

R.A.F. Scorpion Canberras

AT least two R.A.F. Canberras have been fitted with Napier Double Scorpion rocket motors to allow them to take cloud samples at extreme altitudes in connection with nuclear weapon tests at Christmas Island. Canberras of No. 76 Sqn., based at Hemswell, provided cloud-sampling and courier services for Christmas Island tests last November; and one of the Scorpion Canberras was destroyed during a test flight from this airfield last week. The two-man crew, consisting of F/L. J. P. F. De Salis and F/O. P. Lowe, used their ejection seats at 56,000ft after trouble developed; and they survived the subsequent descent, though both were detained in hospital for a time.

They have thus gained the doubtful distinction of having made the highest-ever emergency escape from an aircraft. (The Russian parachutist Nikotin made a delayed-opening jump from 50,469ft

FOR SUPER-SUBS: This is the first photograph to give an indication of the shape of the U.S. Navy's Polaris (see news item on this page). The mock-up on the left shows what appears to be a small, separable warhead. On the right is a firing (of a redwood mock-up) from a Westinghouse launcher, one of several launching systems studied.



SCIMULATOR: A fortnight ago we illustrated a tank-like trolley being used for testing the steam catapults of H.M.S. "Victorious." Now comes the fearsome vehicle shown above, an 18-ton, 37ft-span Scimitar —of sorts—destined for launching, at up to 140 m.p.h., against arrester gear and other deck equipment. The tests will be at R.A.E. Bedford.

TROIS AVIONS, CENT LITS: Three Blackburn Beverleys recently flew a 100-bed field hospital to the U.S.A.F. base at Dreux, in France, for a NATO demonstration. The whole hospital, complete with operating theatre, was set up—part of the installation, complete with "casualties," is shown in this photograph—in less than one hour.

last year, opening his parachute at about 2,000ft. During 1956, Capt. Milburn Apt, U.S.A.F., separated his escape capsule from an X-2 at about 45,000ft over California, but failed to save himself by baling out of the capsule before it struck the ground. S/L. Fifield, Martin-Baker test pilot, made a successful test ejection from a Meteor at 41,000ft and a Hunter pilot was unintentionally but safely ejected at 42,000ft. The U.S.A.F. was planning to make parachute descents from a balloon at heights up to 90,000ft, but had not yet reached this level last year.)

The Scorpion Canberra pilot and navigator were wearing the standard British high-altitude clothing, including g-suit, partial-pressure jerkin and partial-pressure helmet. No clothing was torn off by air blast and the automatic devices—including the M.L. seat-harness releases and Irvin barometric releases Type A Mk 3—worked correctly. The seats separated immediately after ejection and parachutes opened at about 10,000ft. Both men suffered some effects from intense cold and rapid descent.

Army Evaluate EP.9

AN accompanying photograph illustrates the manner in which the Edgar Percival EP.9 can be equipped to carry two stretcher cases and an attendant or walking case in a rearward-facing dispatcher's seat. In this rôle, space is available for blood-transfusion and portable oxygen equipment in the upper part of the cabin. The aircraft illustrated is XM 819, one of a pair of EP.9s which are at present being evaluated by the British Army.

Both XM 819 and its companion XM 797 are painted in standard Army camouflage and have an interior upholstered in grey with red trim. Both aircraft were due to be delivered to the A. and A.E.E., Boscombe Down, by the middle of this month. They have been equipped for operation in various rôles to suit the Army's requirements for maximum versatility. Full night-flying equipment is fitted, together with H.F. and V.H.F. radio. Bulky freight can be transported and air-dropping can be conducted, either from the port door aperture or from the rear access door when the latter is removed. In addition, up to 500 lb can be slung and air-dropped from each of the two under-wing racks. For passenger transport, the EP.9 can seat six, and it is also likely to be used for parachute training, photographic and dual-control training rôles. The aircraft itself was fully described in our issue of December 30, 1955.

KC-135's 10,000-mile Flight

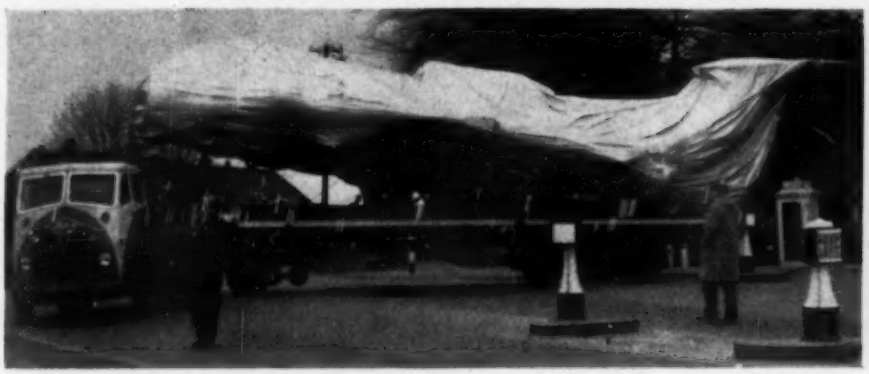
A U.S.A.F. Boeing KC-135 landed at Lajes, Azores, on April 8 after flying non-stop from Tokyo—a distance of 10,233 miles —in 18 hr 48 min at an average speed of 550 m.p.h. It failed to reach its declared objective, Madrid (a further 1,200 miles), because expected tail winds did not materialize; but the flight was the longest without refuelling ever made by a turbojet aircraft and en route it beat the ten-year-old record for a flight from Tokyo to Washington (6,769 miles) by more than 17 hours, passing over the American capital after 13 hr 47 min. The KC-135, which had a crew of seven, was commanded by Brig-Gen. William E. Eubank, Jr., commander of the 93rd Bomb Wing, S.A.C., at Castle A.F.B.

Helicopter Airline Tests Decca

UNDER a contract from the Airways Modernization Board, New York Airways are to evaluate Decca Navigator Mk 10 receivers which will be fitted in all the Vertol 44 helicopters shortly to be delivered to them. The Mk 10 ground stations are already being set up and will be operated by the American Decca licensee, Pacific Division of Bendix Aviation Corp. Also to be fitted are Bendix sonic altimeters which are capable of giving height indications accurate to within a few inches up to several hundred feet above terrain.

STAPLEFORD SOLDIER: Two Edgar Percival EP.9s are being evaluated by the Army, as noted in a news-item above. One of them (right) is seen equipped for casualty evacuation. An Army order may be placed.

SHROUDED FOR SECURITY, and with its wings and nose removed, Blackburn's new NA.39 strike aircraft for the Royal Navy starts its road journey from the maker's plant at Brough to R.A.E. Bedford, where flight trials will soon begin. Powered by two D.H. Gyron Juniors, it clearly has a T-tail; additional details must await its unshrouding and subsequent appearance in the air.



ON COURSE: Members of the Royal Aeronautical Society's third air transport course at Oxford (report, p. 510). Left to right: Front row: Capt. N. J. Robb, B.O.A.C.; Capt. J. Cuddeford, B.O.A.C.; D. C. Tennant, T.C.A. (resident lecturer, operations); S. F. Wheatcroft (resident lecturer, economics); Miss E. B. Croad (secretary); Dr. A. M. Ballantyne (director); K. G. Wilkinson (resident lecturer, operations); A. R. Barrowclough (resident lecturer, air law); F. N. Young, Vickers-Armstrongs; F. P. Stanton, Bristol Aero-Engines. *Second row:* N. A. Barfield, Vickers-Armstrongs; Capt. R. E. Hallam, B.O.A.C.; G. Yacoub, M.E.A.; J. R. Finnimore, B.O.A.C.; A. B. Lowe, English Electric; Capt. A. M. Carroll, B.O.A.C.; J. M. Eardley-Simpson, B.P.; Capt. B. C. Frost, B.O.A.C.; U. Vongsekamalasai, Thai Government; A. Stathalos, B.P., Greece; R. A. J. Kiddle, B.E.A.; F. M. Pisters, Air Research Bureau. *Third row:* A. Letts, Handley Page; W. A. Hamzeh, M.E.A.; Capt. C. A. Butler, B.O.A.C.; K. Pereeson, Air-India; E. P. D'Silva, Air-India; J. Nivison, B.O.A.C.; R. E. Thomas, Vickers-Armstrongs; R. Emoe, Aer Lingus; B. G. F. Bartlett, B.E.A., H. McL. Kendall, Shell-Mex and B.P. *Back row:* N. Birch, Rolls-Royce; A. H. Arbabi, Government of Iran; M. E. L. Spanyol, Armstrong Whitworth Aircraft; J. M. Ramsden, *Flight*; D. S. Warburton and E. Wilks, both Blackburn and General Aircraft; J. de S. Medina, Portuguese West Africa; L. C. Balderamos, British Honduras.

FROM ALL QUARTERS . . .

Royal Visit to Shoreham

A VISIT by the Duke of Edinburgh to Shoreham Airport, previously arranged for last year, will now take place on May 20. He is to drive there from Shoreham in the afternoon, after opening the new harbour installations in the morning and then lunching with the Harbour Trustees and their guests. At the airport the Duke will visit F. G. Miles, Ltd., whose two latest aircraft, the Student and the HDM. 105, will be on view.

He is to meet the heads of companies in the Miles group and inspect their premises and products.

Dr. Cockburn on Guided Weapons

ON April 10, a Royal Aeronautical Society main lecture entitled "Guided Weapons and Aeronautics" was read by Dr. R. Cockburn, C.B., O.B.E., Ph.D., the controller of guided weapons and electronics, Ministry of Supply. His paper, which was in no sense intended to form an official statement, was a discussion of "the impact of guided weapons on our concept of air power and on the field of aeronautics as a whole."

Discussing the use of nuclear weapons, Dr. Cockburn said "military strength will depend more on resources accumulated in peace than the ability to out-produce the enemy in war; and more on technical progress than on the size of front-line forces . . . There is thus little justification for maintaining capacity in peacetime solely for wartime expansion . . . For this country, at least, there can be no longer any question of duplication or of alternative approaches to an operational requirement." He went on to review the interception of bombers by piloted fighters, one of his conclusions being that "the ground-to-air guided weapon must take over the task of air defence; it is no more dependent on its radar environment than the collision-course fighter, and it is superior in performance, lethality and economy of operation."

Dr. Cockburn then discussed guided weapons (concentrating almost exclusively on anti-aircraft defence) and ballistic missiles, and concluded his paper with some comments on manned aeroplanes. The latter, he said, "are still the only means of providing transport, surveillance and tactical support, and the requirements of peripheral war are likely to increase, rather than decrease, the importance of these rôles."

Bréguet Trophy Awarded

FOR "many achievements of great value" in the sphere of helicopters, Mr. Raoul Hafner has been awarded the Louis Bréguet Trophy for 1957. Presented to the Royal Aero Club by the late Sir Richard Fairey to commemorate the work of Louis Bréguet, the trophy is awarded annually to the Frenchman or Briton making the most meritorious achievement in the development of vertical-lift aircraft. The award to Mr. Hafner, who is chief designer (helicopters) of Bristol Aircraft, Ltd., is the second to be made, the first recipient being M. Morain of Sud-Aviation in 1956.

Shorts Receive G.W. Contract

CONTAINED in a letter from the Parliamentary Secretary, Ministry of Supply, to Mr. A. McKibbin, M.P. for Belfast East is the information that Short Brothers and Harland have been awarded a development contract for "a small ship-to-air guided weapon." This is doubtless an outgrowth of the Short SXA.5 missile programme. In October last year Sir Matthew Slattery, Short's chairman and managing director, announced an M.o.S. contract for the development of a test vehicle. Both the Short GPV and SXA.5 were described in our December 6 issue.

SWISS HUNTER: As from April 3 last, when the first Hawker Hunter F.6 was delivered to Switzerland, the foregoing term assumed an aeronautical as well as an horological connotation. The aircraft is seen below before leaving Dunsfold, and on the right Hawker chief test pilot Bill Bedford (left) and test pilot David Lockspeiser (right) are wishing bon voyage to the Swiss pilot Hans Hafliger.

R.N.Z.A.F. BIRTHDAY PARTY

WHEN the Royal New Zealand Air Force celebrated its 21st anniversary with a display at Ohakea on March 29 there were many guests and over 120,000 spectators—a record attendance—present to wish the Force well on its coming-of-age. Among the distinguished visitors was Air Chief Marshal Sir Ralph Cochrane, who as G/C. Cochrane was the first R.N.Z.A.F. Chief of Air Staff: he is seen below with Vice-Admiral Sir John Collins, Australian High Commissioner, and Mrs. P. G. Connolly, wife of the Minister of Defence. The present C.A.S., A. V-M. C. E. Kay (bottom right) became the first New Zealander to fly transonically over home ground, in a U.S.A.F. F-100, three of which took part in the display. He is seen with Col. R. Montgomery of the 801st Fighter Wing. Beneath the birthday key in the hangar (top left) is a Zero, and to the right of it a Thunderbird, one of five missiles brought from Woomera. The outdoor scene shows (reading clockwise): a Canberra, Globemaster, Super Sabre, Hercules, Hastings, B-47 and KC-97. A KC-135 (left centre) takes off during the flying display, which included formation aerobatics by four R.N.Z.A.F. Vampires of No. 75 Sqn., a parachute drop by 23 members of the Special Air Service Squadron and a demonstration (see p. 513) by a Valiant of No. 90 Sqn., R.A.F.

HERE AND THERE

End of Sputnik 2

ACCORDING to Tass, the second (dog-carrying) Russian satellite, launched on November 3, 1957, entered the atmosphere and disintegrated on the morning of Monday, April 14. It had completed some 2,370 circuits, or more than 62,137,000 miles. Reports had previously been received of "a comet-like object" above the West Indies shortly before 2 a.m. on April 14.

Twentieth Century Dart

THE 2,000th Dart engine for Vickers-Armstrongs Viscounts was recently delivered by Rolls-Royce, Ltd.

Air League Elections

NEWLY elected members of the Council of the Air League of the British Empire are G/C. Douglas Bader and Mr. W. J. Carron, president of the A.E.U.

Venezuelan Vampire Order

AN order for five Vampire Trainers for the Venezuelan Air Force has been placed by the Venezuelan Government with the de Havilland Aircraft Co., Ltd. Deliveries are expected to be completed this summer. The Venezuelan Air Force already operates Vampire and Venom fighter/bombers.

World Time-to-Height Record

PILOTED by Jacques Guignard, from Istres, the Sud Trident II recently made two remarkable time-to-height record flights. The second flight, on April 4, was officially observed by the F.A.I. and, subject to confirmation, the times from "brakes off" were to 39,300ft in 2 min 12 sec, to 49,200ft in 2 min 37 sec and to 52,480ft in 2 min 51 sec.

U.S.N. Neptune Order

A NEW order worth £3½m has been placed by the U.S. Navy with the Lockheed Aircraft Corporation for P2V-7 Neptunes and production of these machines will now continue until late in 1959, with the current backlog including contracts for the U.S. Navy, the French Navy and the Japanese Maritime Self-Defence Force. This latest Neptune order coincides with the announcement that in 25 years' operation the Lockheed Corporation has actually delivered 30,000 aircraft.

TANDEM URGE: The Aerfer Ariete fighter, which made its first flight near Naples recently, is powered by a Derwent in the nose and a Rolls-Royce Soar RSr.2 in the tail. The rear engine is fed by a retractable dorsal intake, as shown in this picture from the journal "Settimana Alata."

Atlas No. 7

AFTER ignition trouble affecting one of the two vernier motors a few seconds from the end of the count-down on April 1, the 7th XSM-65 Atlas was finally fired from Cape Canaveral on April 5. Like all the earlier tests, it was a "limited-range" exercise of some 600 miles, the sustainer motor not being fitted. The flight was described at satisfactory.

Broussard Demonstration

AT Sde-dov airfield near Tel Aviv the Max Holste Broussard was demonstrated on April 7 by M. Pierre Clostermann, the famous French wartime R.A.F. fighter pilot and now a member of the National Assembly. Because of its ability to take off and land on short strips the Broussard is being considered for use as a crop-spraying and communications aircraft in the Negev Desert and also for a service to Jerusalem.

Second Jetstar Flies

THE second prototype of the Lockheed Jetstar utility transport made its first flight —from Marietta, Georgia, to Edwards Air Force Base, California—on April 3. It is to make a 20-day tour of military command headquarters, beginning with an evaluation by Air Force, Navy, Marines and Coast Guard pilots in Washington, D.C. The demonstration tour will continue to the west coast and will end at the Lockheed air terminal at Marietta.

Crackenback Pioneers

CONSTRUCTIONAL work on a chair lift in the Australian Alps is being assisted by Helicopter Utilities, Ltd., whose aircraft handled 100 tons of building material in the first four days' operations. Sections of 12 steel towers which are to be built have to be transported across the Thredbo River on to the slopes of Mt. Crackenback. This is the first time helicopters have been used in Australia for such work.

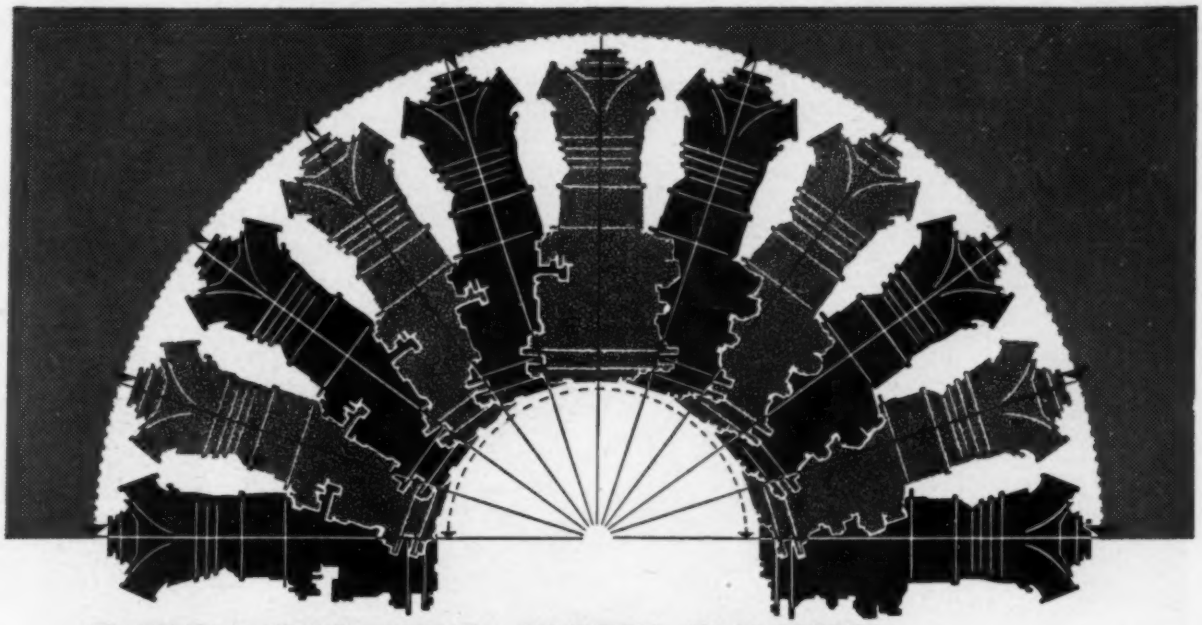
Holidays By Road

A ROAD map and touring guide, covering holiday areas in Great Britain and Northern and Southern Ireland, and consisting of four 16-page loose insets, is being presented with four consecutive issues of our associated journal *The Motor Cycle*, starting with the special Holiday Number which appeared yesterday, April 17. Each map is supplemented by a guide to places of historic and scenic interest, and a town-to-town mileage chart is included.

Hucknall Fire-tunnel

IN our full description of the Comet 4 (March 28 issue) a caption to a photograph of the Rolls-Royce fire-tunnel at Hucknall gave the impression that this facility was built specifically for proving the resistance to fire of the RA.29 installation in the Comet. The tunnel is, of course, a long-established facility in which tests have been run on such diverse installations as the Avons in the Valiant and the Darts in the Viscount. The airflow is induced by a pair of Nene turbojets operating on the ejector principle.

UNCLE SAM APPROVES: Mr. Louis Morda, of the U.S. Department of Commerce, is here seen performing two identical and significant ceremonies. On the left, he is presenting to Mr. J. J. Parkes, Alvis managing director, the C.A.A. type certificate for the Leonides 502/8, 503/8 and 504/8 engines; and on the right he is handing over to Sir John Evetts, Rotol managing director, an equivalent certificate for the propellers on the Viscount 812 for American service. A note on the award of the Britannia's C.A.A. certificate appears on page 509.



DESIGNERS WELCOME THE NAPIER GAZELLE

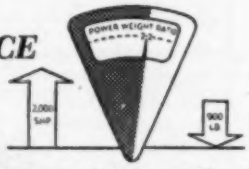
'Any angle' installation gives greater freedom

Napier's Gazelle offers a welcome break to 'tied' helicopter designers. This rugged free-turbine engine can be mounted on simple supports in the helicopter structure UPRIGHT, HORIZONTALLY, OR IN ANY POSITION IN BETWEEN.

This 'any angle' installation relieves the designer of many accepted limitations. It also gives him more opportunity to make proper use of fuselage space—valuable space which should, after all, be used for payload accommodation.

The Bristol 192—chosen by the Royal Air Force—is powered by two Gazelles.

HIGH PERFORMANCE —LOW WEIGHT



The Gazelle has an impressive power/weight ratio. Originally designed for a power output of 1,260 s.h.p., it is now well on the way to developing 2,000 s.h.p. for a weight of 900 lbs.—a ratio of 0.45 lb./s.h.p. By removing the need for clutches, cooling fans, etc., the free turbine arrangement knocks pounds off the weight of the transmission mechanism.

30% RESERVE POWER

The design of the Gazelle provides a range of ideal helicopter powers. Among them are short-period emergency power outputs up to 30% above the normal maximum. Helicopters demand tough, reliable engines: the Gazelle is designed for strenuous duty and long service between overhauls. And when the time for overhaul comes, economical speedy maintenance is assured by the Gazelle's essential simplicity and the 'unit' principle on which it is built.

REPAIRS BY REPLACEMENT

This principle means that Gazelle components and assemblies are interchangeable—and easily accessible. Reduction gear, free turbine, compressor turbine and combustion system, compressor and accessories can all be replaced as self-contained, individually tested assemblies. The metering control unit can also be replaced as a rig-tested unit needing only minor adjustment.

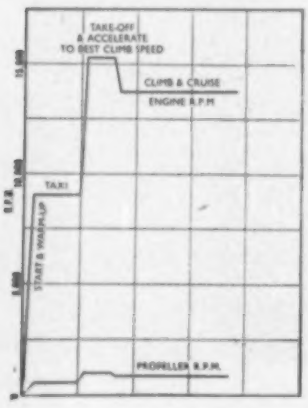
D. NAPIER & SON LIMITED, LONDON, W.3

A Member of the
ENGLISH ELECTRIC Aviation Group

CSC 67

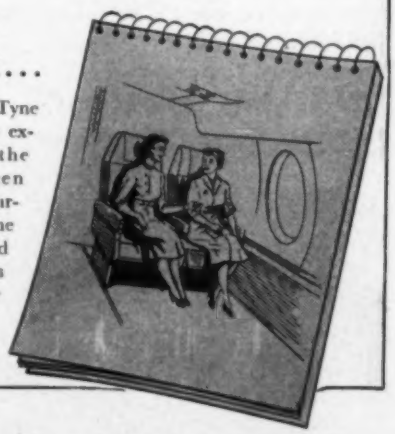
Yes, with the VANGUARD

The many problems of noise nuisance on and around airfields will be reduced by the introduction of the Vickers Vanguard. Noise from the four Rolls-Royce Tyne propeller-turbines is remarkably low for an aircraft of the Vanguard's size and power. This will be of particular advantage when operating from airfields in or near residential areas. A lower noise level on the airport will also increase efficiency in the administrative blocks and improve the broadcasting of passenger information. The lower interior noise and vibration will win approval from operators, pilots and passengers.



For your notebook...

Gases from the Tyne engines are only exhausted after the power has been absorbed by the turbine. This is one reason for reduced noise. The other is the low propeller tip speed.

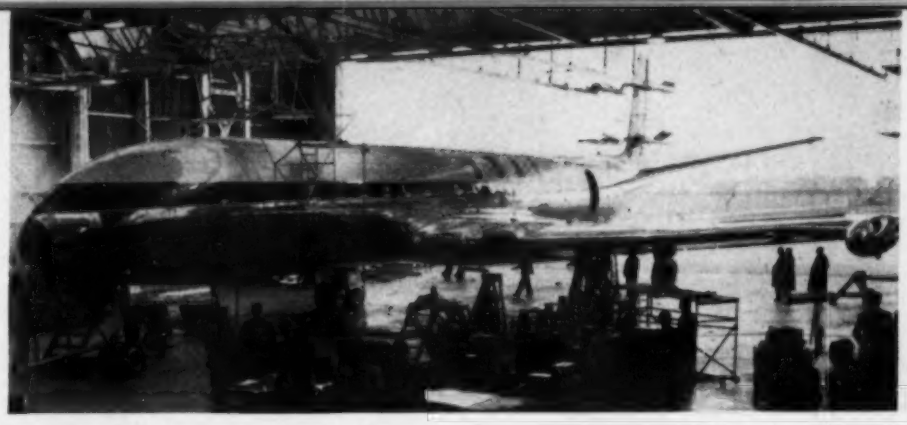


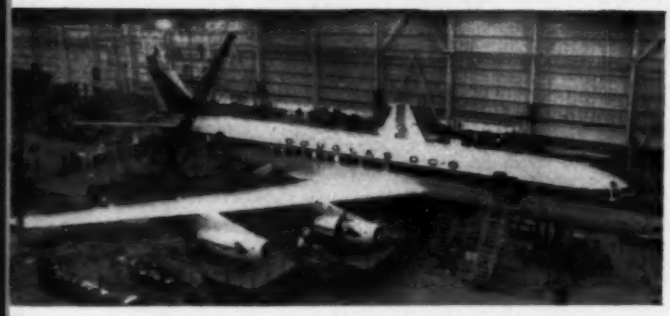
VICKERS VANGUARD

FOUR ROLLS-ROYCE TYNE PROPELLER-TURBINE ENGINES

VICKERS-ARMSTRONGS (AIRCRAFT) LIMITED WEYBRIDGE SURREY

TGA AT541





History was made on April 9 at Hatfield (right) with the appearance of the first Comet 4 for B.O.A.C., and at Santa Monica (below), where the first completed DC-8 was rolled out soon after this final assembly photograph was taken.

CIVIL AVIATION

ROLLING OUT THE JET AGE

AS recorded in the caption to the photographs above, the roll-out of the first Comet 4 and the first DC-8 took place on the same day last week. In spite of the coincidence of simultaneous public appearance, the Comet programme is well ahead of that of the American jet. Production of Comet 4s for B.O.A.C. is already gathering momentum at de Havilland's Chester factory and first deliveries will begin later this year. B.E.A.'s six Comet 4Bs, on the other hand, are to be built at Hatfield.

Persistent recent rumours that Aerolineas Argentinas may buy Comet 4s were given substance last week when Vice-Commodore Ramon Morales, head of the purchasing commission now visiting Britain, announced in London that a contract for six Comets would probably be signed in Buenos Aires before the end of the month. The agreement remains to be ratified by the Argentine Government, but the prospect of a firm order appears very bright. The value of the order is apparently about £10,125,000 with spares, and Señor Morales gave as one reason for the choice of Comets that he had found in London credit facilities for five-year instalment terms. Another reason was that de Havilland could offer delivery of the first aircraft in December of this year, followed by two more in January and February 1959—apparently without detriment to deliveries of Comet 4s to the Corporation. The order would be completed by June 1960, but Aerolineas Argentinas hope to start operations between Buenos Aires and New York as early as March next year; the Comet would halve the flight time of 26 hr now taken by the airline's DC-6s.

The roll-out of the DC-8, magnificently finished in red, white and blue, was presided over by Donald W. Douglas, Jr., president of the Douglas Aircraft Company; and stewardesses of 17 airlines that have placed DC-8 orders were invited to attend the occasion. Unusually for Douglas, the programme has slipped a month or so behind, but deliveries and first services are still expected to be started by the end of 1959. Nine aircraft will be used to accelerate C.A.A. certification flight-testing. Work is now proceeding on 11 DC-8s at Santa Monica and a peak production rate of six per month should eventually be achieved.

B.E.A. and LOT inaugurated direct Warsaw-London services on April 8. Mr. J. Rustecki, the Polish Vice-Minister of Communication, was greeted by Mr. A. H. Wilson, Deputy Secretary (Civil Aviation) of the M.T.C.A. on arrival.

AUSTRIAN AIRLINE REVIVAL

AS briefly noted in these pages recently, Austrian Airlines began scheduled flights between London and Vienna on March 31 and thus opened the second chapter in Austrian national civil air transport history. The first ended in 1938, when OELAG (Oesterreichische Luftverkehrs Gesellschaft, A.G.), first civil operator of Junkers Ju52s, was absorbed by Lufthansa following the Anschluss.

Austrian Airlines have had rather protracted birth-pangs, having grown out of two separate companies proposed early in 1956 by the two parliamentary political parties. Air Austria was a Black or Conservative party venture which was to have had K.L.M. support and co-operation, while Austrian Airways were Red or Socialist and were to have had similar help from S.A.S. Neither venture reached the operating stage, because of many difficulties and deficiencies; and it was decided two years ago to form a single company with both S.A.S. and K.L.M. support. Even this scheme met with many obstacles and it was not until the end of September last year that the first official meeting of Austrian Airlines was held. The whole operation has been organized since then, with the Conservatives holding 42 per cent of the capital, the Socialists 28 per cent, and S.A.S. and Fred Olsen 15 per cent each.

The aircraft fleet consists of four Viscount 779Ds leased from Olsen until 1960 and flown by some Olsen captains who have acquired Austrian nationality (by reason of Austrian peace-treaty requirements). Other crew members are Austrian and they will take over full responsibility in due course. The daily Vienna - London return service is now in full swing with a very pleasant 48-seat tourist layout and a flight time of 2¼ hours. The enthusiasm of all Austrian Airlines personnel is tremendous and their hope to establish a reputation as "the friendly airline" seems well founded. Very soon a daily flight to Zürich will be started; and this will be followed in turn by services to Hamburg via Frankfurt (connecting with numerous trans-Atlantic flights), to Paris (daily), to Warsaw (two or three per week, complementing LOT schedules by agreement), and to Rome (three per week on a short route crossing Jugoslavia if permission can be obtained). When these services are operating, average aircraft utilization will be some 6.4 hours a day.

Austrian Airlines will be ordering their own equipment and to this end are considering the Viscount 810, Vanguard, Caravelle, Comet 4 and Convair 880. They have made no firm decision yet, but the Viscount 810 seems to be uppermost in their minds and probably best suited to their particular requirements. The company will also take over the hangar at Schwechat Airport, their home base, as a maintenance base when the new terminal building is complete.

BRITANNIA GRADUATES

APRIL 10 should go down as an important date in the life-chart of the Bristol Britannia. On that day Mr. R. B. Myersberg, representing the U.S. Civil Aeronautics Authority, handed over the airliner's type-test certificate to Dr. A. E. Russell, Bristol Aircraft's chief engineer. Northeast Airlines are now in a position to accept the five Britannia 305s ordered in December 1955 for delivery in October and November 1957.

The chain of incidents that led to Northeast not receiving these aircraft in time to cater for the winter traffic on their newly awarded New York to Florida route is well known. And at one time it seemed possible that Northeast's order might be lost. May 1 had been set as the deadline date for C.A.A. certification: this would allow the necessary operational planning and crew indoctrination to be completed in comfortable time to begin Britannia operations between New England and Florida this coming autumn.

CIVIL AVIATION . . .

AIR TRANSPORT AT OXFORD

LAST Friday, April 11, marked the end of the third air transport course at Oriel College, Oxford. As in the previous two years, it was arranged by the Royal Aeronautical Society, whose description of its aim and purpose may be quoted as follows:—

> "In such a complex industry as air transport, management tends to become departmentalized, both in experience and approach; it tends to lack the broad knowledge which is essential to the man who aspires to wider responsibilities, and on whom the future depends. This broader knowledge is difficult to acquire; it is to overcome this difficulty that the Air Transport Course has been conceived."

For three weeks each year around Easter-time (when the University is down) about 30 such men take leave of the hurly-burly of their air transport activities to assimilate, in the peaceful scholastic atmosphere of Oriel College, that "broader knowledge." They come, as the photograph on page 506 indicates, in diverse nationalities from all sections of the industry.

The three-week course is highly concentrated: lectures begin at 9 a.m. and finish at 6.15 p.m., with guest speakers on three or four evenings a week. The students actually attend a total of 52 lectures and addresses, each followed by a half-hour discussion. Towards the end of the first week, the resident lecturers (see below) present "case studies" to the course. These are tackled, mainly in the students' spare time, and in a highly competitive spirit, by three groups or seminars. This year the main case-study took the form of the sort of problem which is today facing most airlines. A hypothetical route-network varying in stage-lengths from 150 to 3,500 miles was presented, together with 1957 traffic results, costs, revenues, frequencies, types of aircraft, competition, and so forth. The problem was to decide, on the basis of these data and on individually agreed assumptions, a fleet-replacement programme for 1965. "Manufacturers' data" on six hypothetical new transports, three jet and three turboprop, were supplied. This exercise developed to a notable degree one of the most valuable, if incidental, aspects of the course—the cross-pollination of experience and ideas among the students themselves.

Resident lecturers: S. F. Wheatcroft, economics; K. G. Wilkinson (B.E.A.) and D. C. Tennant (T.C.A.), operations; A. R. Barrowclough, air law.

Guest lecturers: Bo Bjorkman, secretary-general, Air Research Bureau; V. de Boursac, secretary, Traffic Conference 2, International Air Transport Association; Winston Bray, commercial planning manager, B.O.A.C., Horace Brock, executive vice-president, New York Airways; B. M. Brough, organization and methods officer, B.E.A.; Thomas T. Carter, Civil Air Attaché, U.S. Embassy in London; E. J. Dickie, deputy director, Control and Navigation (Plans), M.T.C.A.; G. Fitzgerald, commercial research and schedules manager, Aer Lingus; W. G. Franklin, joint managing director, Silver City Airways; Raymond Nivet, assistant to deputy d.g., Air France; Professor E. J. Richards, Professor of Aeronautical Engineering, Southampton University; F. H. Robertson, chief project designer, Short Bros. and Harland, Ltd.; L. Scarman, Q.C.; J. B. Scott, chief economics officer, B.O.A.C.; Dr. K. R. Sealy, lecturer in geography, London School of Economics; Ross Stainton, general manager, eastern routes, B.O.A.C.; R. H. Whitby, performance and analysis manager, B.E.A.

Opened in London on April 9 were Silver City's new offices in Knightsbridge. Since the company cut their fares last December, they have booked 30,000 cars. Last year the number was 14,000 over the same period.

Guest speakers: R. E. Hardingham, secretary and chief executive, Air Registration Board; F. M. Owner, consultant to de Havilland Engine Co.; Sir Duncan Cumming, director, Associated Companies, B.O.A.C. and managing director of Associated British Airlines (Middle East); Peter Masefield, vice-president of Royal Aeronautical Society and managing director of Bristol Aircraft; Dr. G. S. Hislop, chief designer of helicopters, Fairey Aviation; Professor D. Goedhuis, Professor of Air Law at Leyden University and Civil Air Attaché at Royal Netherlands Embassy in the U.K.; Capt. R. B. Tapp, London manager of Qantas Empire Airways; Sir William Hildred, director-general, I.A.T.A.

The traditional Bonally Dinner which concluded the Course had a distinguished top table, including Sir William Hildred and Sir Arnold Hall (who proposed the toasts); Sir Frederick Handley Page; Sir Sydney Camm; Mr. N. E. Rowe; Maj. G. P. Bulman; Mr. S. N. Grant-Bailey and Mr. Henry Marking (who together originally inspired the Course); and Professor J. Jewkes.

BREVITIES

CANADIAN PACIFIC AIRLINES' first Britannia trans-Arctic service will leave Amsterdam late on Sunday, June 1, arriving at Vancouver at 0640 the following morning. C.P.A.L. Britannia services to Hong Kong (via Tokyo) and to Australasia are planned to start in August and October respectively.

* * *

Boeing is planning to buy back 14 of B.O.A.C.'s 16 Stratocruisers during 1959.

* * *

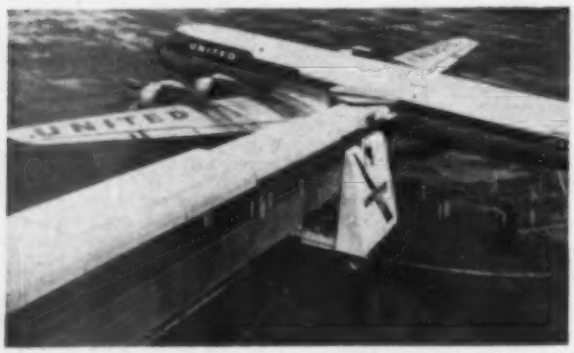
Trans-Australia Airlines have taken up their option on a further six Fokker Friendships, bringing their total combined order to 12.

* * *

Cairo radio has reported the purchase of Tu-104s by Misrair/Syrian Airways.

* * *

Paris airport authorities have forbidden C.S.A. to operate Tu-104s into Orly because of the aircraft's high noise-level.



Latest information from New Zealand suggests that T.E.A.L. is to be re-equipped with Electras rather than Comet 4s.

* * *

T.A.I. are reported to be negotiating with the Australian Government for permission to serve Sydney instead of Brisbane, and also to extend their services across the Pacific to California.

* * *

We regret to record that on April 6 a Capital Airlines' Viscount crashed during approach to Tri-City airport, Michigan. All 44 passengers and three crew lost their lives.

* * *

By mid-summer all B.E.A. international services will be flown by Viscounts, except for local Gibraltar operations and for the London - Salzburg service, on which DC-3s will continue to be used.

* * *

A Bill shortly to be placed before the Australian Federal Parliament will propose that carriers' liability on inter-State services be increased from £A2,000 to £A7,500, bringing rates in line with those agreed at The Hague in 1955 for international services.

* * *

Supplies for Australia's first chair-lift, rising 1,440ft from Thredbo, N.S.W., to Crockenback Peak, will be transported by helicopters belonging to Helicopter Utilities Pty., Ltd. The airlift, involving about 100 tons of material, will take four days to complete.

* * *

In return for allowing Aeroflot to transit Copenhagen on London - Moscow services, S.A.S. will be permitted to overfly Russian territory on services between Scandinavia and the Middle East, will receive rights for a second route to Moscow, and will be granted navigational assistance on their polar services to Tokyo.

Extensible finger: installed at O'Hare Airport, Chicago, is this passenger "aero-gangplank." It can be adjusted by remote operation.

CLUB AND GLIDING NEWS

LAST week-end's good gliding weather brought with it a new crop of British distance, goal and speed records, including two 500 km flights—the first Diamond C distances to be achieved in this country. On Saturday, April 12, Cdr. Nicholas Goodhart flew a dog-leg track of 319 miles in his Skylark 3 from Ely to Rosudgeon, five miles east of Penzance, with turning points at Edgehill and Ludgershall. The straight-line distance of this flight was 295 miles. On the same day two 194-mile flights were made from Lasham to Perranporth, Cornwall, one by Wally Kahn and John Williamson in the Kahn syndicate's newly delivered Slingsby T.42 *Regal Eagle*; and the other by Mrs. Ann Burns in her Skylark 3. Kahn and Williamson's flight was a British and U.K. two-seater goal record and U.K. 300 km two-seater goal speed record (42 m.p.h.); while that of Mrs. Burns (subject to confirmation) gains the British and U.K. women's records for goal and distance, and the U.K. women's 300 km goal speed record.

From Dunstable, nine cross-country flights totalling 1,325 miles were also made on April 12. Philip Wills in a Skylark 2, after an upwind aero-tow to a point over East Anglia, flew 226 miles to Okehampton. Three 191-mile flights to Plymouth were made—by Charles Ellis (Skylark 3), John Westhorpe (Skylark 2), and Norman Preston in the veteran Gull 1; and other destinations included Ashburton, Exeter and Newbury.

Also included in Saturday's soaring was a flight of 186 miles from Nympsfield to Land's End by Peter Scott, flying solo in his T.42 *Sea Eagle*. This flight completed his Gold C. Peter Collier flew a Skylark 2 of Bristol Gliding Club a distance of 182 miles, also from Nympsfield.

Weather conditions on Sunday, April 13, were not so obviously good, but David Ince set up a British straight-line distance record in Elliotts' new Olympia 419 with a flight of 315 miles from Lavenham, Suffolk, to Sennen, near Land's End. This flight, made mainly by means of dry thermals in a blue sky, adds a second diamond, for distance, to David Ince's Gold C.

THE first motor race-track since the war to provide landing strips and send out a welcome to the flying fraternity was overwhelmingly rewarded on Easter Monday. Goodwood, north of Chichester, was staging the first big car racing programme of the season, organized by the British Automobile Racing Club, and no fewer than 74 aircraft flew in when only some 30 had been expected; but there was room for all, and Tim Morice (controlling the airfield for the Duke of Richmond and Gordon) was more than satisfied.

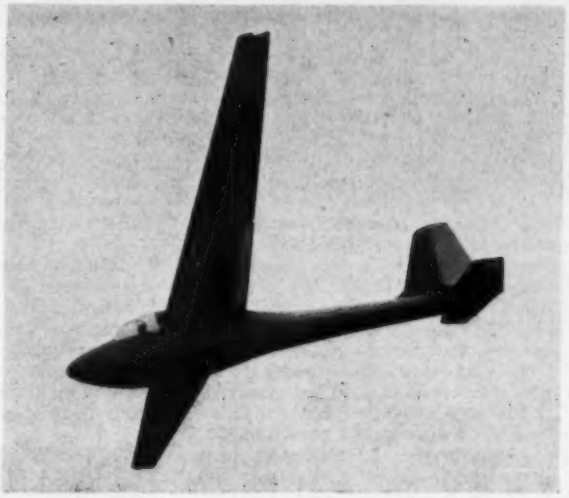
Before the racing started the Tiger club gave a display *en masse;* three tied Tigers flew around in formation, and a pair of Druine Turbulents built by Norman Jones of Rollasons were put through their modest paces. Maurice Imray commentated.

Among the larger aircraft present was the Automobile Association's Rapide which, in its yellow and black livery, manages to look exactly like other A.A. vehicles and would not appear out of place at a road junction with the pilot in shiny black leggings.

Visitors by road and air were rewarded by excellent racing, in cold dry weather, two of the main events being won by Stirling Moss (Aston Martin) and Mike Hawthorne (Ferrari). It is to be hoped that other race organizers, e.g., at Silverstone, will follow suit by welcoming aircraft. Obviously, however, as at Goodwood there should be no flying while racing is actually in progress.

THE formation of Phoenix Aircraft, Ltd., "to develop the designs of the old Luton Aircraft Company and to produce new designs for ultra-light aircraft," was recently announced. The company's first project is a modified version of the Luton Minor parasol single-seater, amateur-construction plans for which have been submitted to the Popular Flying Association for approval. Designed to be powered by a 37 h.p. Aeronca J.A.P. engine, or by any engine up to 65 h.p., the new Minor is designated the L.A.4a. The general structure of the aircraft has been simplified, a fixed fin has been added to the tail unit, the re-designed undercarriage can be equipped with brakes and a tailwheel is fitted.

According to the company, "the airframe of the Minor can be built for approximately £125"; "suitable engines are available which cost about £100 complete with propeller"; and "the total cost of the aircraft should not exceed £250 with the J.A.P. engine." Plans and instructions cost £11 10s, and the company hope at a later date to supply pre-fabricated parts and, possibly, complete kits.



Only 15 days after its first flight the Olympia 419, flown by David Ince, achieved the first 500 km straight-line glider flight in Britain (see news item on this page). The new sailplane is made by Elliotts of Newbury and will compete in this year's World Gliding Championships.

Directors of the Phoenix company are C. H. Latimer-Needham (the designer of the original aircraft in 1936) and A. W. J. G. Ord-Hume, who are now working on a new version of the two-seat Luton Major. Inquiries should go to Phoenix Aircraft, Ltd., Cranleigh Common, Cranleigh, Surrey (telephone Bramley 2289).

FOLLOWING the death of Roger Druine, the French light-aircraft designer, Madame Druine has appointed Harold Best-Devereux to act on her behalf in the English-speaking countries of the world to ensure the continued availability of Druine designs for amateur constructors. Mr. Best-Devereux and M. Druine were close friends for a number of years. Sets of plans for Druine aircraft will continue to be available from the Popular Flying Association, and Mr. Best-Devereux will ensure the supply of technical data, translations and revisions to P.F.A. members. On any matter concerning Druine aircraft Mr. Best-Devereux can be contacted c/o the Popular Flying Association, Londonderry House, 19 Park Lane, London, W.1.

FINAL selection of the aircraft to be flown by British pilots in the World Gliding Championships has now been made. Although comparison tests between the new Olympia 419 and two versions of the Skylark 3 indicated that the Olympia's performance and handling were superior, Elliotts are unable to complete a second machine of this type in sufficient time for the championships because of other commitments. Pilots and aircraft are as follows:—

Open Class.—Nicholas Goodhart (Slingsby Skylark 3), Anthony Deane-Drummond (Elliotts Olympia 419).

Standard Class.—Philip Wills (Slingsby Skylark 2), Anthony Goodhart (Elliotts Olympia 415).

NEW chief flying instructor of the Wiltshire School of Flying, Thruxton, is S/L. R. J. Honeyman, previously senior ground instructor at the R.A.F. Central Flying School.

REVISED opening date for the Leszno Congress of OSTIV (Organisation Scientifique et Technique Internationale du Vol à Voile) is now Thursday, June 19, one week later than previously announced. The president of OSTIV, Mr. L. A. de Lange, visited Leszno last month to discuss arrangements.

BOTH gliding and power flying will be included during a week-end rally organized by the British Women Pilots' Association for May 31-June 1 at Sandown, Isle of Wight.

The Easter Monday line-up of aircraft at the Goodwood race-track airstrip comprised no fewer than 74 machines (see news-item above). Our sister journal "The Autocar" speeded its report and pictures of the meeting by invoking the aid of "Flight's" Gemini.

Straight and Level

IT has become the practice of many people, both within and outside the business of making or operating aeroplanes, to criticize the "procurement" policy of airlines or governments. (It has to be "procurement"; the word "buying" is much too simple and unimpressive to be attractive.) Now I adhere to the age-old dictum that people should practise what they preach; and, furthermore, that professional preachers should be very careful indeed about what they themselves practise. I would not feel competent to criticize someone for buying the wrong aeroplane if I had just discovered that I had personally chosen to have the wrong type of car. And more than once I have stood at a bar with the feeling "this beer is wrong procurement—both money and time could be better spent—I just enjoy it."

Even those who write critical documents should guard against their own incorrect procurement of words. I have in my hand a highly colourful tirade against the procurement policy of "Whitehall," written in such terms that it is abundantly clear that the author is ignorant of the precise meaning of several of his words. Please don't think I am trying to stifle criticism; but I do believe that critics should put their own house in order first.

● One of the biggest military bases in the world is Camp Cooke, California, where the U.S. Air Force conduct most of their ICBM training. I am delighted to read that Convair are assigning a staff of their own at Camp Cooke "to establish criteria for Atlas ICBM complexes, integrate installation of ground-support equipment and checkout the complexes upon completion . . ." If only I understood what it meant.

● The other week this column agreed with the sentiment that "it's tough at the top" in industry. One of the most well-founded and prosperous firms in the aeronautical world is Douglas Aircraft; but they must have a hard job keeping their income ahead of their expenditure. I believe that their daily bill for raw material exceeds $1,000,000; and I have just read that they have established a publications centre at Lawndale (south of L.A. international airport) for the 950 tech-pubs people. Yes, I said 950. Man, what overheads!

● I believe it was Einstein who first demonstrated that mass could be completely destroyed and turned into energy. Without indulging in such subatomic sleight-of-hand, I wonder how many of my readers can solve this one. If one were to weigh a Boeing B-52D at, for example, Castle A.F.B., California, one might well find the weight to be 400,000 lb avoirdupois. If the aircraft then took off and headed for New York and, *en route*, refuelled to replace all the fuel consumed since starting the engines, the weight would only be brought back to about 396,500 lb. But should the pilot decide to abandon his mission and head back to Castle, the weight would rise to some 403,500 lb. Next week I shall try to explain why.

● What do you think the chances are of a Minister of the Crown getting up and saying, "I particularly want to set the minds of some of you at rest on one point: the fate of this aircraft has in no sense been decided by its technical merit. The decision has been taken on purely political grounds."

● The old country is in a pretty bad way again. So one could conclude from the above picture. Obviously one of two things is happening. Either we are so short of cabers (for tossing) that Highland flingers have to practise with any odd Skylark rocket that happens to be around; or we are so short of conventional rocket-launching equipment that we have to employ caber-tossers to do the job. We've all heard of economy cuts, but this is ridiculous.

In actual fact this Skylark is appearing at the Factory Equipment Exhibition at Earls Court. And what have research rockets to do with factory equipment? That's a very good question. *You* work it out.

● Senator Flanders, the well-known Republican from Vermont, said in a recent television programme that it was "as necessary for the United States to occupy outer space and rule space as it was for England to rule the seas in her conflict with Spain." Well, I've read enough science fiction and seen enough horrific space films to be able to talk the language, but never before have I heard a serious suggestion that anybody should "occupy" outer space. It could be that quite a lot of people would agree with the suggestion that the first drafts of personnel to outer space (wherever that may be) should be the world's politicians.

● Of course, if one can build a big supersonic tunnel next to a waterfall, one can save quite a lot of money—either by using hydro-electric power or by driving the compressor (or fan, whichever you like to call it) by a Pelton wheel, as the French have done. I see that a survey of the Commonwealth was made some time ago to find a site where this could be done. The answer that came up was Tasmania. Just how far away can you get?

● Actions, my Scoutmaster used to say, speak louder than words. Among those who believe in both is one Michael Gee, Finchley accountant and glider pilot. Not long ago at the Kronfeld Club, Mr. Gee spoke, with eloquence and David Carrow, against the motion "That this house wants gliding in comfort and joy." The motion was carried. His words having failed to stem majority approval of the modern decadence of comfortable gliding, Mr. Gee gives a practical demonstration of the fact that a little discomfort is all part of the game. How? By landing the Cambridge Club's Olympia in the sea just off Llandudno, after a bungee launch from the Great Orme. He was soaked to the skin.

● As a matter of fact, this particular glider was dunked once before, by Jim Grantham in the North Sea off Clacton in 1950. What was it that chap Masefield wrote? . . . "I must go down to the sea again, To the lonely sea and the sky . . ." And while we're talking about the joys of gliding, how about the Swiss sailplane pilot who, at 7,000ft over Locarno last week, was attacked by a 10ft-span royal eagle? According to the *Times* correspondent, "the pilot escaped this violent attack only by nose-diving, and the bird was finally *put to flight* [my italics] by a Swiss Air Force fighter pilot."

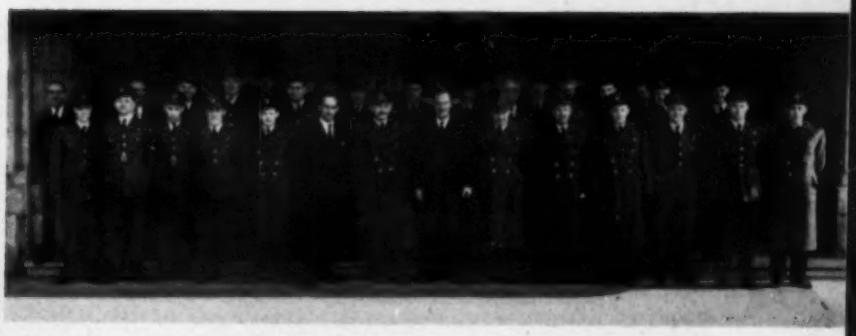
Anyone for croquet?

● Did you ever take a close look at some madeira cake? I've just had some that is almost indistinguishable, except for taste, from some of these foamed-in-place fillers.

● I rather liked the remark of Mr. J. W. S. Brancker, traffic director of I.A.T.A.: "Only the rich can afford to travel slowly." But when I read this out to a colleague he commented: "Is there a grain of truth in that?"

Well, is there?

ROGER BACON



SERVICE AVIATION

Royal Air Force and Naval Flying News

Visitors to D. H. headquarters at Hatfield were (above left) members of the R.A.F. Staff College, Bracknell; and to A. V. Roe's at Chadderton and Woodford, officers of No. 617 (the "dam busters") Sqn., which after re-formation is being equipped with Vulcans.

Senior Postings

TWO senior appointments take effect on May 12. A. Cdre. P. G. Wykeham becomes Director of Operations (Fighter and Theatre Air Forces) at Air Ministry; and G/C. R. B. Thomson becomes A.O.C. Gibraltar with the acting rank of air commodore.

A. Cdre. Wykeham has been Air Commodore in charge of operations at H.Q. Fighter Command since July 1956. He had a distinguished wartime career as a fighter pilot, winning the D.F.C. in the Western Desert in November 1940 and a Bar to it the following year, and being awarded the D.S.O. in 1943 and a Bar to it in 1944. In the latter year he was commanding No. 140 Wing and led the famous attack by 24 Mosquitoes on Gestapo headquarters in Aarhus. During 1945 he took the R.A.F. Staff College course at Bracknell and subsequently did test-flying at the A. and A.E.E. For making many hazardous strikes against the enemy in Korea (where he was lent to the U.S.A.F. as an expert adviser on fighter-intruder techniques) he was awarded the U.S. Air Medal; and in 1951 he was awarded the A.F.C.

G/C. Thomson, who since April 1955 has been Group Captain in charge of Operations (Air) at Coastal Command, spent much of the last war on anti-submarine operations in the Atlantic and the Bay of Biscay. He was mentioned in despatches in 1942 and when with No. 172 Sqn. early in 1943 was awarded the D.S.O. in recognition of his successes against U-boats and shipping. Then in September that year, when commanding No. 206 Sqn. (Fortresses), he and two members of his crew were awarded D.F.C.s after attacking and sinking a submarine south of Iceland despite withering fire and the fact that their aircraft had been repeatedly hit. G/C. Thomson had to ditch the Fortress and with his companions drifted for three-and-a-half days in a dinghy before being rescued. In March 1944, when he took No. 206 Sqn. to the Azores, G/C. Thomson brought in the first four-engined aircraft ever to land on the grass airfield at Lagens.

Fighter Command Post

HAVING been Group Captain in charge of Operations at Fighter Command since July last year, G/C. T. B. de la P. Beresford becomes Air Commodore in charge of Operations from mid-April, with the acting rank of air commodore.

His previous appointments have included the command of No. 233 O.C.U. at Pembrey and prior to that of R.A.F. Ballykelly. During the war he commanded No. 260 Sqn. and later No. 233 Wing in the Western Desert, being awarded a Bar to the D.F.C. and also the D.S.O. for his prowess in operational leadership. His first D.F.C. was won on the North-West Frontier in 1938.

First-Class Entry

TWO cadetships to Cranwell and one to Henlow were among the distinctions gained by graduates of the 80th entry of aircraft apprentices at No. 1 Radio School at R.A.F. Locking, whose passing-out parade was reviewed on April 1 by Air Marshal Sir Arthur McDonald, A.O.C.-in-C. Technical Training Command, who described the apprentices as "first class in every way." Although the entry was small —39 apprentices graduating as air radio, ground radar or ground wireless fitters—it set up a record in gaining three cadetships to the R.A.F. colleges, and it provided ten of the station's first XV in the best-ever season for apprentice rugby.

Linton Wings Parade

ON April 3, Rear Admiral D. R. F. Cambell, Flag Officer Flying Training, presented brevets to successful students as Reviewing Officer of the first wings parade held by No. 1 Flying Training School at R.A.F. Linton-on-Ouse. The school moved to Linton from R.A.F. Syerston at the end of last year, and early this year the former No. 7 F.T.S. at Valley also moved there. With Provosts from Syerston and Vampires from No. 7 F.T.S. (which trained Naval as well as R.A.F. pilots), No. 1 F.T.S. is the first school to combine both basic and advanced flying training on the same airfield.

IN BRIEF

A. Cdre. T. N. Coslett, who has been appointed to command No. 1 School of Technical Training at R.A.F. Halton, Bucks, is an ex-apprentice of the school.

* * * * *

Maj. H. M. Sealy, U.S.A.F., recently arrived in Sydney to take command of No. 75 Sqn., R.A.A.F., at Williamtown, N.S.W.

* * * * *

A Yugoslav military mission, in Britain to consider possible purchases of aircraft and associated equipment, recently visited No. 1 Guided Weapon Development Sqn. at R.A.F. Valley.

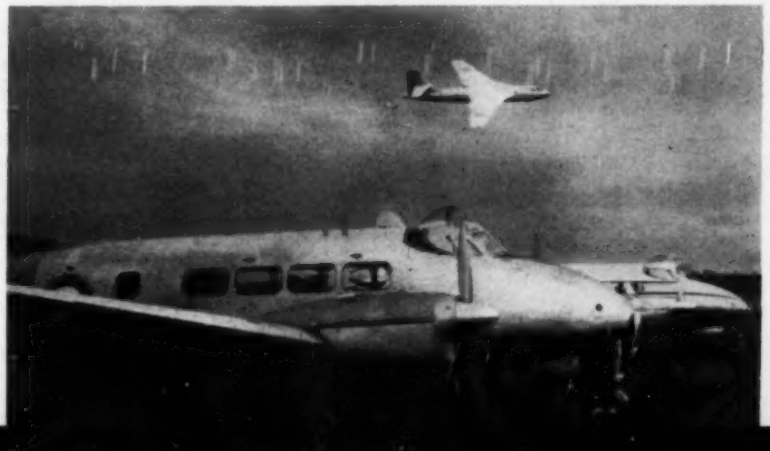
* * * * *

The R.A.F.'s Benevolent Fund's residential school at Vanbrugh Castle, Blackheath, is to be reorganized as a choir school to provide choristers for the R.A.F. church of St. Clement Danes.

* * * * *

An advisory group of approximately 40 R.C.A.F. personnel is being attached to the West German Air Force at Oldenburg to assist in advanced operational training on Sabres. Germany is receiving 75 Mk 5s from Canada under Mutual Aid and has bought 225 Mk 6s from Canadair, Ltd.

A Valiant from No. 90 Sqn., flown by W/C. L. H. Trent, the only surviving New Zealand air V.C. participating in the R.N.Z.A.F. 21st anniversary display at Ohakea (see also page 507).



Correspondence

The Editor of "Flight" is not necessarily in agreement with the views expressed by correspondents in these columns; the names and addresses of writers, not for publication in detail, must in all cases accompany letters.

Congratulations, Southampton

I AM sure readers who feel strongly about the preservation of historic aircraft will be overjoyed to hear of Southampton Corporation's action in this respect.

The second Supermarine S.6B, S.1596, is now on display on the promenade of Royal Pier, Southampton. The machine has a roof over its head, and the worst of the weather is kept off by sidescreens. Souvenir hunters and the like are kept off by a fence. Small, comprehensive (and, as far as I know, accurate) notices enlighten interested spectators.

She appears to be in good condition. The colours are accurate, but the blue is rather pale; I have seen the original described as dark blue. Her racing number "7" is painted on her.

Vickers-Armstrongs presented her to Southampton Corporation. The latter should be congratulated on their action in preserving this historic machine and, what is more, displaying it in a prominent place.

It is a fitting monument to a great aircraft, and Southampton appear to be justifiably proud of their association with it.

Totland Bay, I.o.W. GRAHAM V. STALLARD.

London Terminal

IN the letter from J. Davies in your April 4 issue I see once again the curious superstition that the proper place for an air terminal is in the centre of London. It seems to me self-evident that the terminal should be no further from the airport than is necessary to reach adequate public transport.

Suppose the terminal were located at Charing Cross, as Mr. Davies suggests. I live near Notting Hill Gate, and would have to leave home about 50 minutes before the coach was due to depart in order to be sure of arriving at Charing Cross fifteen minutes before that time. Thirty minutes after leaving, the coach would pass within a mile or so of my home. One mile in an hour and a half is *not* the rate of progress I expect with air travel!

Suppose, instead, the terminal were at Hammersmith Broadway. I should have to leave home 35 minutes before coach-departure time, and the coach journey would take perhaps forty minutes less. The wide margin of time that now has to be allowed as an insurance against traffic hold-ups in central London would no longer be needed, and another 15 to 30 minutes could be saved there. It all adds up to a saving, for me, of about an hour and a half.

Even people starting from a hotel in the Strand would get to Hammersmith quicker by tube than by airport bus, so removal of the terminal would help them too; and are there any parts of London from which travellers could not get to Hammersmith more quickly by going direct than via Charing Cross?—especially as airport coach means slower travel than by tube.

I could regard a centrally placed air terminal as sensible only on condition that there was the fast railway direct to the airport mentioned by Mr. Davies (but we won't see that for a few years yet), and that there was a subsidiary terminal, at the nearest point to the airport adequately served by public transport, and that every airport train stopped there to pick up or set down those who preferred to embark or leave at that point.

London, W.11. A. L. M. SOWERBY.

Anniversary Omission?

ON the occasion of the dinner at Bentley Priory to celebrate the fortieth anniversary of the foundation of the Royal Air Force, B.B.C. Television prefaced their splendid presentation of the event with a film to illustrate the history of the Service. This started with the formation of the R.A.F. under the wise leadership of Trenchard in 1918, and included such peacetime work as the first Atlantic flight by Alcock and Whitten-Brown and the continued efforts of those R.A.F. pilots whose three successive wins resulted in the Schneider Trophy becoming the outright property of Great Britain. Proper tribute was also paid to the heroes of that Battle which the Queen later described as ranking with Trafalgar and Waterloo as one of the really decisive battles of history.

Naturally in the context of such a film as this, the number of names to be mentioned individually was small, but I was astonished to find that nowhere was there a reference to the greatest genius the Royal Air Force has ever produced.

Is the invention of jet propulsion considered less of an achievement than bravery in battle, leadership in the field, or mastery of air pilotage?

London, W.1. JOHN GRIERSON.

Metropolitan—Non-Convair

IN your issue of March 14, Roger Bacon in his feature "Straight and Level" made some comments on the rolling stock on London Transport's Metropolitan Line. He wrote that the improvements recently announced would not affect the rolling stock, but this is a mistake. For the services to Amersham, Chesham and Watford 248 new cars are to be built at a cost of over £5,000,000.

His complaints about resonating windows and "stick-slipping" brakes probably refer to the saloon type of stock used on some of the inner Metropolitan services. Some portions of the under-floor control equipment, which has made the windows on this stock vibrate, are now being replaced, and in the meantime attention is being given to the bedding of the windows. Alterations to the brake rigging have overcome the problem of chattering brakes.

London, S.W.1. R. M. ROBBINS.
Chief Public Relations Officer, London Transport Executive.

THE INDUSTRY

Weybridge Prizegiving

WHEN Viscount Knollys, chairman of Vickers, Ltd., presented prizes to apprentices of Vickers-Armstrongs (Aircraft), Ltd., at Weybridge recently he said that parents "played a not inconsiderable part" in building up their children's careers; a good home was invaluable for providing the stability essential for the type of technical training Vickers were offering.

In introducing Lord Knollys, Sir George Edwards, managing director of Vickers-Armstrongs (Aircraft), Ltd., said that his lordship had always had some connection with aviation, from the First World War onwards, including having been one of the post-war chairmen of B.O.A.C.

Lord Knollys presented the Weeks Trophy—awarded to the outstanding apprentice of the year—to J. A. Bailey. Outside distinctions gained during the year by apprentices of Vickers-Armstrongs (Aircraft) included six B.Sc.s; eight Higher National Diplomas; 13 Higher National Certificates; and 78 Ordinary National Certificates.

IN BRIEF

Mr. John G. Boyd, personal assistant to the late Mr. D. F. McIntyre, has retired after 20 years' service with Scottish Aviation, Ltd., at Prestwick. He is succeeded by Mr. W. Cummings, who for the past four years has been manager of the company's London office.

* * *

Mr. D. M. Wiggins has been appointed sales manager of Docker Brothers, the Birmingham manufacturers of aircraft and other finishes, and Mr. B. C. (Bunny) Payne takes over as manager of the aircraft sales division. Mr. Payne was formerly the company's aircraft representative in the London area and he is succeeded in that position by Mr. W. C. Dudley, who has a wide experience of paint materials and their application.

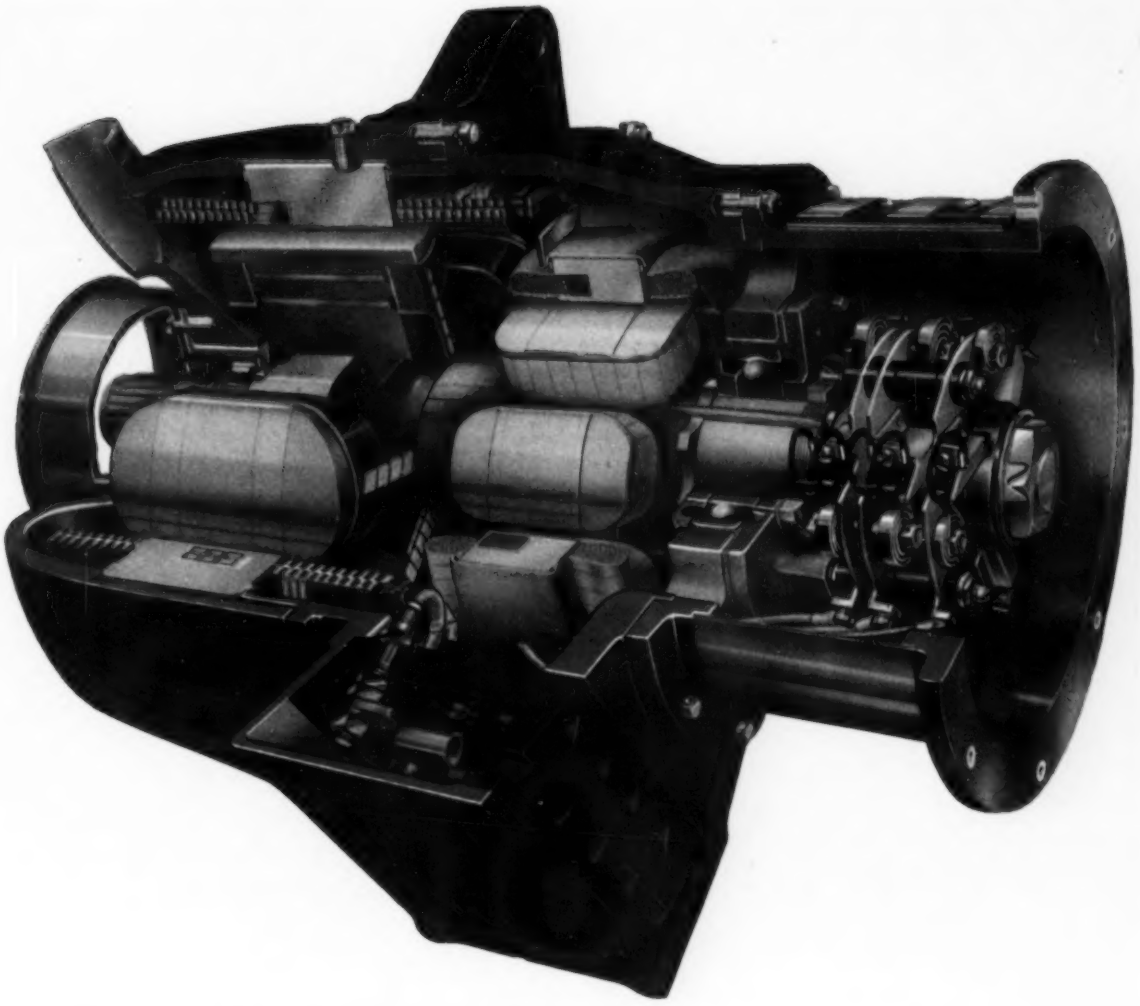
Mr. William H. Snee, who has been appointed manager of aviation products sales for Western Europe by the Goodyear International Corporation. Mr. Snee, formerly assistant manager of the company's aviation products division, is operating from offices in London in his new appointment.

* * *

A new factory housing the combined production of Permali, Ltd., Hordern-Richmond, Ltd., and Jabroc, Ltd., was opened at Gloucester on April 3. The building, which has an area of 160,000 sq ft, houses the largest plant manufacturing densified wood laminates in Europe.

* * *

It will be recalled that in our issue of April 4 an illustrated description was given of the recessed sliding doors designed to surround the tails of aircraft being overhauled at B.O.A.C.'s London Airport base. It should be made clear that the company responsible for fabrication and erection of the doors was Morfax, Ltd., Willow Lane, Mitcham, Surrey.



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One advertisement in a series of nine

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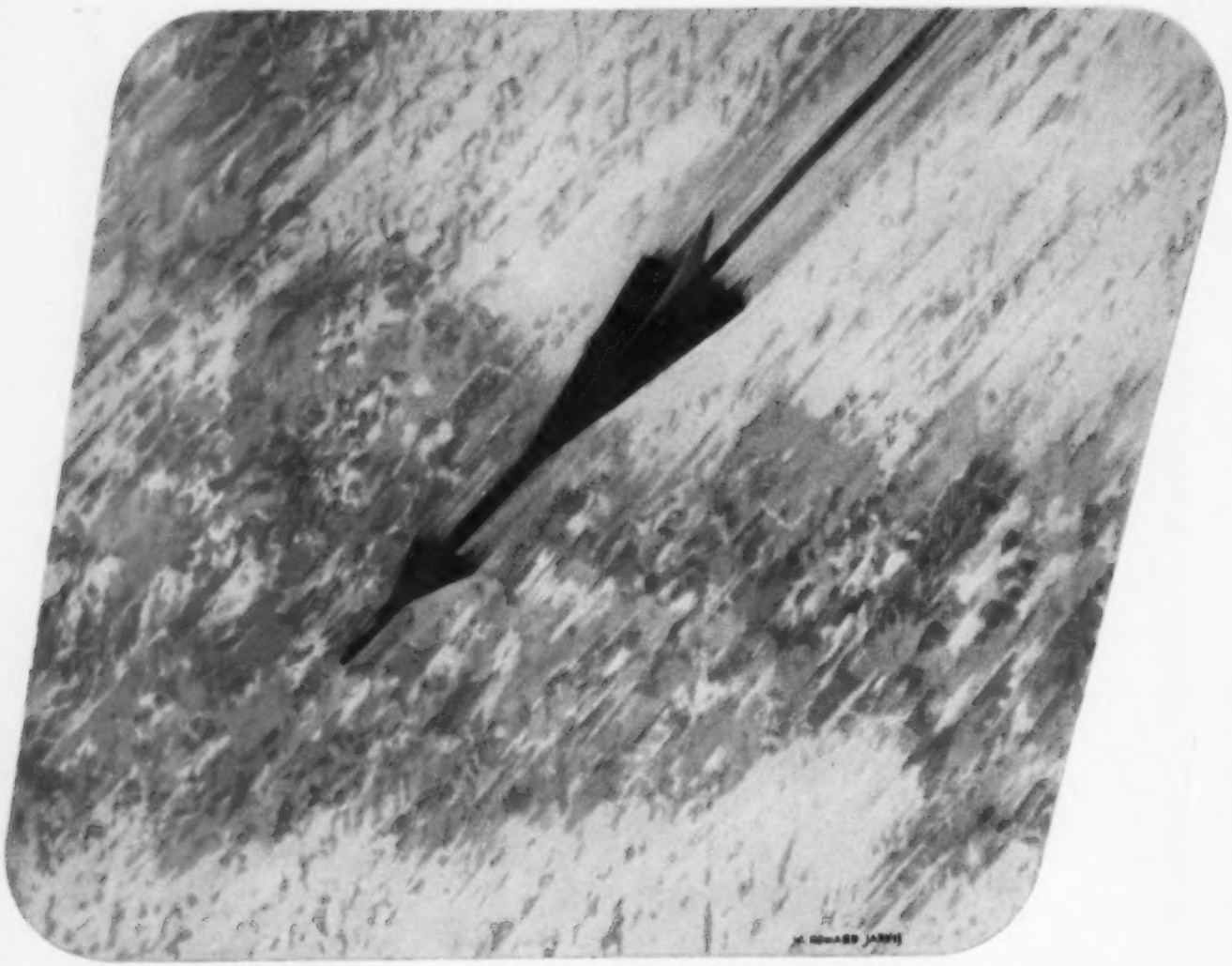

Flying above nacreous cloud at 105,000 ft.

This illustration is an artist's impression — based on reasonably certain knowledge — of how nacreous cloud will appear when seen from above. This mother-of-pearl cloud, composed of ice crystals, is found at heights between fourteen and twenty miles up, and is visible from the ground about three hours after sunset.

The aircraft shown is based on a reliable forecast of types that will be in production within a matter only of years from now. The fuels and lubricants it will require, giving positive performance at the thermal extremes involved in high altitude flying, are already being developed in the Esso laboratories.

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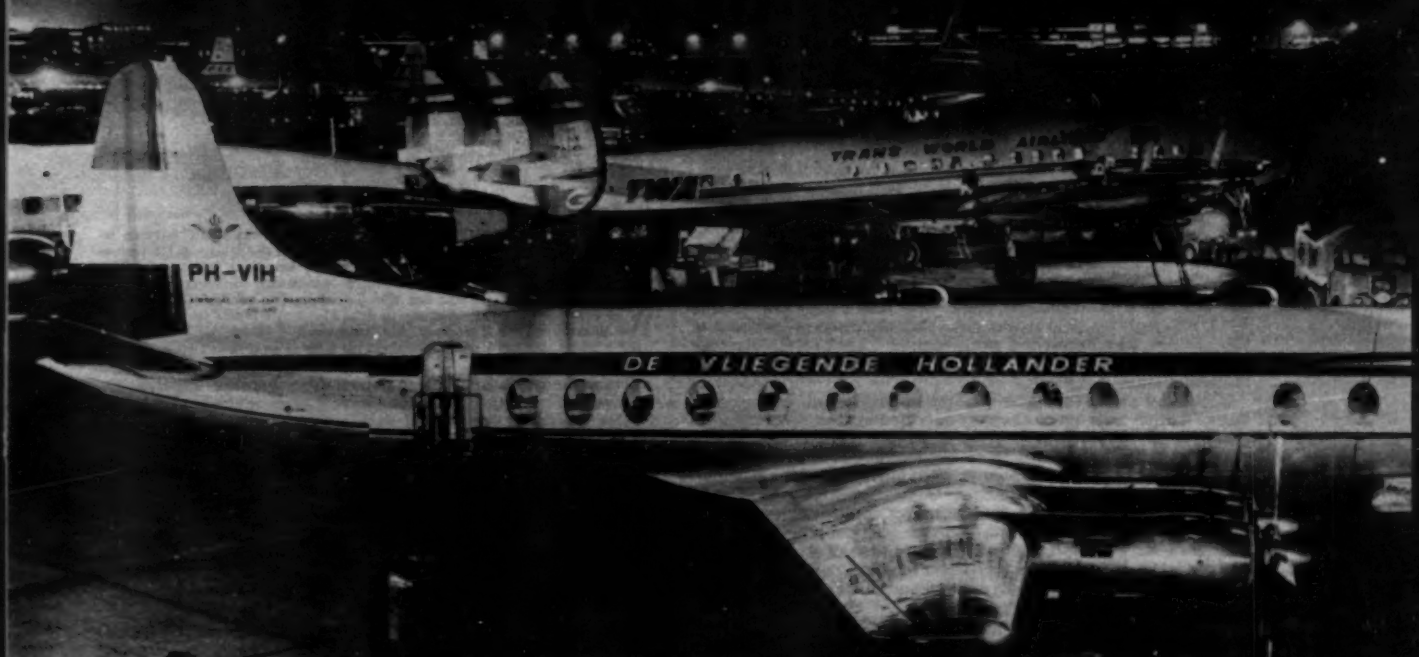
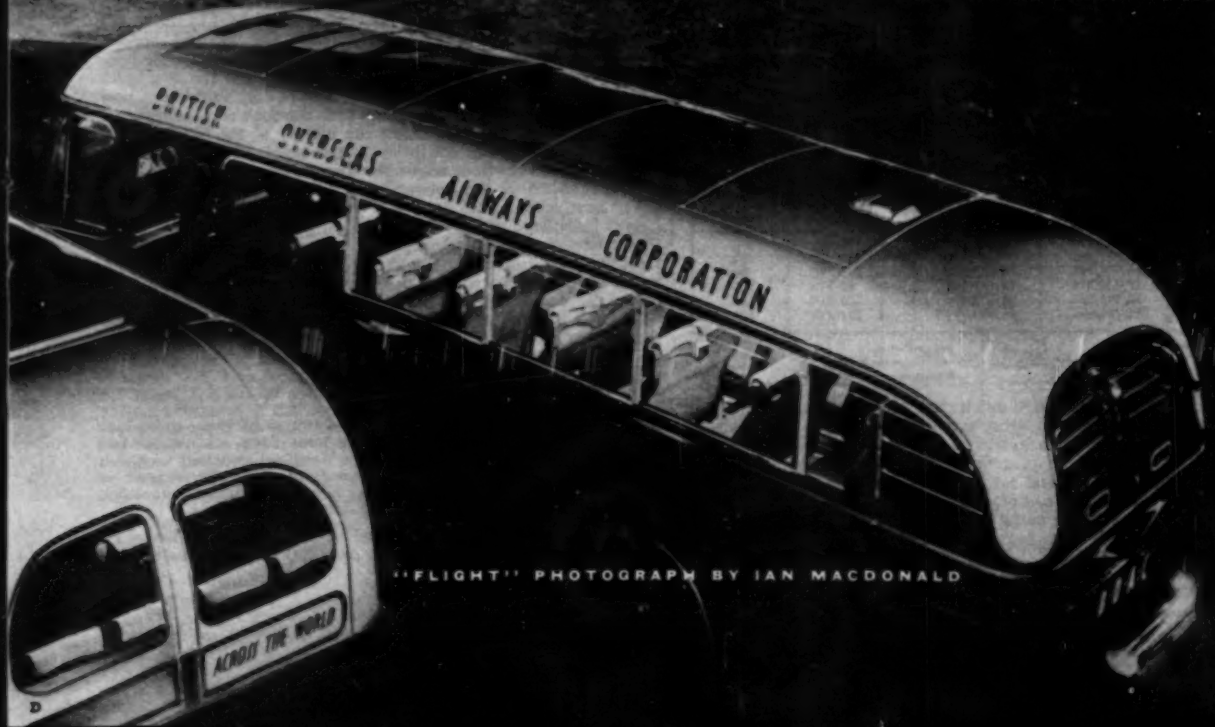
AIRLINES OF THE WORLD

A "FLIGHT" SPECIAL REVIEW



AIR transport stands at the brink of a technical revolution. Before the year is out the jet age will be in. The following pages review the industry, its operating results, its equipment and its problems in this most significant year.



"FLIGHT" PHOTOGRAPH BY IAN MACDONALD

THE EUROPEAN OUTLOOK

AIR TRANSPORT FINDS ITS FEET

IN these pages Mr. Stephen Wheatcroft, who is economic adviser to B.E.A., re-examines from the economic standpoint the status of European air transport in 1958 and its prospects over the next few years. His conclusions—abstracted from a paper which he delivered recently in Rome before the Centre for the Development of Air Transport—may be considered as bringing up to date his classic study on this subject "The Economics of European Air Transport," which was completed in 1954 and published as a book in 1956.

TWO major changes can be seen in the situation in 1958 as compared with 1954. The first is in the financial stability of the regional airline industry. It can now be said with confidence that it is possible for local European air services to be operated on a self-sufficient basis; this was hardly true before 1953, although by 1954 it was clear that the financial position of the airlines was improving very rapidly. This metamorphosis from deficit to profitability in European air transport will be examined later.

The other major change which has taken place in the past four years is the near-revolutionary development in the politico-economic environment in which air transport has to work. Current moves towards integration in the economic life of Europe will inevitably produce, in due course, great changes in the regulation of air transport in this Continent. A fundamental presumption of the new spirit in which Europe moves towards integration is that economic nationalism must now be abandoned. And in the European air transport industry the abandonment of economic nationalism could result, in my view, in the removal of some of the major barriers which have delayed and perverted the development of the industry in the past.

Economic Progress. To illustrate the progress made in the financial position of the European airlines in the past four years it is necessary to review briefly the economic record of B.E.A. from 1951 to 1957. B.E.A. is, of course, the largest regional airline in Europe; it carries about 25 per cent of the local traffic. Its results are, therefore, of some importance in the overall European picture, but B.E.A. figures are also used for this purpose since, despite the valiant work of the Air Research Bureau, it is still quite difficult to get published data about the operating costs for the local services of most of the other European airlines.

During the past six years B.E.A. has been transformed into a profitable airline. In 1953-4 the Corporation was still making a substantial loss, but during the past three years it has operated at a small profit. In the current financial year it is expected that the profit will be larger than in any previous year and a figure of about £1m has been mentioned by Lord Douglas. The financial results of the period are set out in Table I.

TABLE I: B.E.A. FINANCIAL RESULTS, 1951–1957

Year	Expenditure (£)	Revenue (£)	Profit or Loss (£)	Operating Ratio*
1951–2	12,241,298	10,817,687	−1,423,611	88
1952–3	14,587,211	13,128,080	−1,459,131	90
1953–4	16,546,967	14,773,170	−1,773,797	89
1954–5	17,078,275	17,141,314	+ 63,039	100
1955–6	20,995,880	21,599,494	+ 603,614	103
1956–7	23,731,004	23,947,774	+ 216,770	101

* Operating ratio is $\frac{\text{Expenditure}}{\text{Revenue}} \times 100$

These figures do not give much clue to the reasons for B.E.A.'s transition from losses to profit-making. In 1953-4 the loss was greater than it had been in any of the four preceding years and the operating ratio—the percentage relationship between revenue and expenditure—showed no sign of improving. Yet it was in that year that changes took place in the B.E.A. economy which led to a profitable position being reached in the subsequent years.

A much more useful guide than overall revenue and expenditure to the significant changes in an airline's economic position is the relative costs and revenue of each unit of traffic year by year; Table II sets out the basic data for B.E.A.

TABLE II: ANALYSIS OF B.E.A. FINANCIAL RESULTS, 1951–1957

Year	Output c.t.m. (millions)	Exp'ture per c.t.m. (d)	Revenue Load-factor (%)	Exp'ture per l.t.m. (d)	Revenue per l.t.m. (d)	Profit or loss per l.t.m. (d)
1951–2	56.7	51.8	64.7	80.3	70.8	−9.5
1952–3	69.2	50.6	62.9	80.5	72.1	−8.4
1953–4	83.6	47.5	64.1	74.1	66.2	−7.9
1954–5	98.3	41.7	64.7	64.4	64.5	+0.1
1955–6	124.5	40.5	63.2	64.0	66.0	+2.0
1956–7	139.1	41.0	64.5	63.5	64.0	+0.5

In this table the cost and revenue for each load ton-mile are compared and the difference between them expressed as a profit or loss per load ton-mile. The load factor achieved by the airline is clearly a major factor in an analysis of this kind and this has been included in the table. But although the load factor is of great importance (and in any one of the profitable years the small surplus could have been wiped out by a small adverse variation in the load factor), nevertheless, it was not any change in the load factor which was the most significant development in the 1951-57 period. The significant change took place between 1952 and 1954 when, in general terms, the revenue rate fell rapidly but the cost level was reduced at an even greater rate. B.E.A.'s profitable position was first achieved in a year in which both the costs and the revenue level had fallen to the lowest in the history of the Corporation. The significance of both of these changes needs to be examined in more detail and it will be suggested that they are not unconnected.

The interconnection between the lower revenue rate and the lower cost level arises from a "benevolent downward spiral." Lower fares have the effect of developing a higher traffic volume, the increased traffic enables operations to be conducted on a more intensive plan (including the use of larger aeroplanes), the more intensive operations lead to a lower level of operating cost and hence the benevolent circle is completed.

In their report for 1954-55 B.E.A. quite specifically concluded that it was exactly this benevolent downward spiral effect which had led them to a profitable position in that year. They stated:—

"Tourist fares at reduced rates were introduced by B.E.A. on international services in April 1953. At the time of B.E.A.'s report for 1953-54, the long-term economic effect of this policy could not be clearly determined because, although tourist fares increased traffic substantially in 1953, the increase was not immediately as great as had been expected. There was a time-lag in the effect of tourist fares, but there can be little doubt now that much of the traffic increase in 1954-55 and in the current year have been the result of stimulation from the major fare reductions introduced in 1953.

"B.E.A.'s new, larger aircraft are capable of achieving lower costs

per seat-mile than the earlier aircraft. The large increases in traffic over the past two years have made possible the exploitation of the economic potential of these bigger aircraft. The increasing scale and intensity of our international operations has helped B.E.A. to raise its economy to a profitable plane. The tourist fare policy thus appears to have been one of the major factors in laying the foundation for economic success in 1954-55 and for the future."

The conclusion reached by B.E.A. in 1955 is of considerable importance at the present time when the airlines of the world are again contemplating a step comparable with the introduction of tourist fares in 1953. The new low "economy" class fare across the Atlantic opens a new phase in air transport development. The result, both for the public and the airlines, may be as successful as was the tourist fare development. But the financial success of the "economy" class, like tourist services, will depend very largely upon the lower cost benefits of higher-intensity operations.

The fall in B.E.A. operating costs from 51.8 pence per c.t.m. in 1951-52 to 41.0 pence in 1956-57 warrants detailed study. Costs per unit of output fell over 20 per cent in a period which was characterized throughout Europe by a steady rise in almost all other prices. In terms of a constant value of money B.E.A. unit costs have fallen by 36 per cent in the past six years.

TABLE III: B.E.A. COST BREAKDOWN, 1951–1957

	Expenditure per c.t.m. (pence)					
	1951–2	1952–3	1953–4	1954–5	1955–6†	1956–7
Maintenance and overhaul* ...	9.1	9.8	8.9	7.9	8.3	7.8
Flying operations* ...	15.0	15.8	13.9	11.5	9.7	9.9
Passenger and cargo services	3.8	3.2	2.2	2.0	2.0	2.0
Station costs ...	9.7	9.5	9.1	8.1	8.0	8.7
Sales and publicity ...	4.7	4.7	4.3	3.9	3.8	3.8
Technical training*	2.0	0.9	0.7	0.4	0.4	0.5
H.O. administration	4.4	3.7	3.4	3.1	2.9	3.2
Aircraft standing charges*	2.3	2.2	3.3	3.0	3.5	3.7
Amortization of development expenses*	0.2	0.1	0.1	0.4	0.3	—
Interest on capital, etc.*	0.6	1.0	1.5	1.2	1.1	1.4

* Based on net c.t.m. after deducting chartered aircraft production.
† Includes £300,000 (0.6d. per c.t.m.) for Elizabethan fatigue-testing and modification.

Some of the explanations of this large fall in the level of B.E.A. operating costs can be seen immediately by looking at the main items of operating expenditure in Table III. Set out against nine major cost classifications is the cost per c.t.m. in each of the past six years. These costs do not add up to the same total c.t.m. cost as that shown in Table II because it is necessary to make corrections to allow for capacity produced by chartered aircraft. In some years a significant part (up to 4 per cent) of B.E.A. capacity has been produced by aircraft wholly owned, maintained and operated by other carriers. The true B.E.A. cost per c.t.m. for such items as maintenance, flight operations and aircraft standing charges must, therefore, be calculated on the basis of the net c.t.m. production after deducting charter capacity. Table III therefore gives the costs per c.t.m. based on the net or total c.t.m. production as appropriate.

The extent of the changes in the cost level can be seen by comparing the first and the last years. In Table IV the monetary and the percentage changes in the cost per c.t.m. for each classification have been set out.

TABLE IV: CHANGES IN B.E.A. COST STRUCTURE, 1951–1952÷1956–1957

	Expenditure per c.t.m (pence)			
	1951–2	1956–7	Difference	Change %
Maintenance and overhaul ...	9.1	7.8	−1.3	−14
Flying operations	15.0	9.9	−5.1	−34
Passenger and cargo services ...	3.8	2.0	−1.8	−47
Station costs	9.7	8.7	−1.0	−10
Sales and publicity	4.7	3.8	−0.9	−19
Technical training	2.0	0.5	−1.5	−75
H.O. administration	4.4	3.2	−1.2	−27
Aircraft standing charges ...	2.3	3.7	+1.4	+61
Amortization of development expenses	0.2	—	−0.2	—
Interest on capital, etc. ...	0.6	1.4	+0.8	+134

It is apparent that the most important change which took place in the B.E.A. cost structure from 1951 to 1957 was the reduction in the costs of flying operations: these fell by 5.1 pence per c.t.m., a fall of over one-third from their 1951 level. What caused this radical improvement in flying operation costs?

The major items included in this cost category are: fuel and oil, aircrew pay and expenses, landing fees. All three of these items show a significant fall in their c.t.m. cost level, but the greatest reduction is in the aircrew pay and expenses.

Aircrew pay and expenses per c.t.m. have fallen by 38 per cent in the past six years, clearly a major contribution to the overall reduction in operating costs. This fall has occurred over a period in which the actual level of aircrew salaries has risen very substantially, indicating a very large increase in productivity. The factors which determine the c.t.m. level of aircrew costs are: (a) level of pay and allowances, (b) average composition (number) of crew, (c) annual utilization of crew, (d) aircraft productivity (c.t.m. per hour).

In very broad terms the changes in these factors over the past six years have been: (a) pay and allowance, 22 per cent increase; (b) average composition, 4 per cent reduction; (c) annual utilization, 10 per cent reduction; (d) aircraft productivity, 108 per cent increase.

The large reduction in aircrew costs was, therefore, almost exclusively due to the increase in aircraft productivity: an increase which was primarily based on the larger size of the Elizabethans and Viscounts rather than upon their increased speed.

Fuel and oil costs per c.t.m. fell by over 30 per cent over the six-year period. This fall can be attributed, in part, to a lower price of petrol and kerosine but the major influence was the better specific consumption rate for the newer aircraft introduced during the period. (A small additional factor was the increased deployment of non-taxed-kerosine-burning Viscounts on the domestic trunk routes.)

In fact, all cost items fell by significant percentages except those relating to capital charges. Both aircraft standing charges and interest on capital rose very sharply in this period in which all other costs were reduced. This is likely to be indicative of a general trend which is continuing throughout the airline industry and it calls for further comment. But first summing up the B.E.A. economic record for the past six years are the factors in Table V which have been mainly responsible for the great improvement in the level of operating costs.

TABLE V: B.E.A. PRODUCTIVITY IMPROVEMENT, 1951–1957

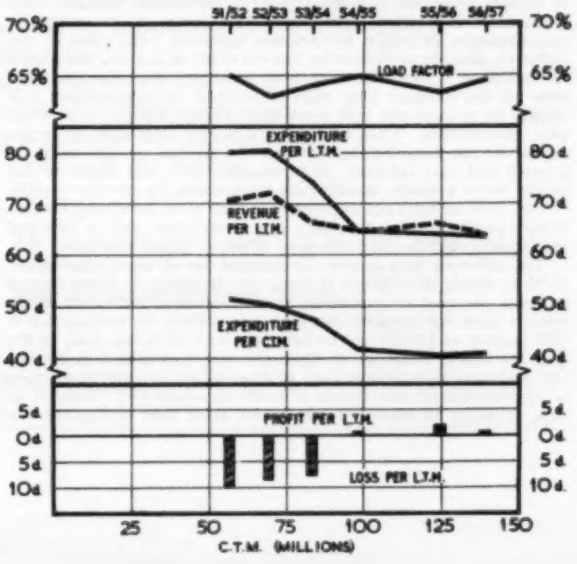
Productivity Factor	1951–2	1956–7	Improvement %
Aircraft productivity (c.t.m./hr.) ...	369	767	108
Aircraft utilization (annual hours per a/c)	1,404	1,867	33
Route density (tons/mile)	2,361	3,394	44
Station utilization (l.t.m. per station)	0.6m	1.2m	100
Staff productivity (c.t.m. per employee)	7,136	13,244	85

TABLE VI: EUROPEAN AND U.S. PRODUCTIVITY, 1956–1957

Productivity Factor	Europe (B.E.A. 1956–7)	U.S. (Capital 1956)	U.S. Advantage (%)
Aircraft productivity (c.t.m./hr) ...	767	1,240	62
Aircraft utilization (annual hours per a/c)	1,867	2,600	40
Route density (tons/mile)	3,394	6,100	80
Station utilization (l.t.m. per station)	1.2m	2.1m	75
Staff productivity (c.t.m. per employee)	13,244	33,000	150

These illustrate the great advances which have been made by B.E.A. in recent years in its productivity, but by comparison with U.S. standards all the figures for 1957 are still very low. In Table VI are set out a comparison of these same indices using the B.E.A. figures as representative of European standards and those of Capital Airlines as indicative of the 1957 level of productivity in the United States. Capital Airlines figures for the United

Fig. 1. Analysis of B.E.A. financial results, 1951-57.



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States have been taken because of certain basic similarities between this airline's operations and those of European air carriers. Capital is a very short-haul airline and, moreover, is of particular interest in this comparison because a large proportion of its routes are now flown by British-made Viscounts.

It is these differences in productivity which primarily account for the considerable differences which still persist in the level of operating costs between Europe and the United States. These cost differences are set out in Table VII which, like Table VI, compares B.E.A. and Capital Airlines results.

TABLE VII: EUROPE AND U.S. OPERATING COSTS, 1956-1957

	Expenditure per c.t.m. (pence)		European Difference (%)
	Europe* (B.E.A. 1956-7)	U.S.† (Capital 1956-7)	
Maintenance and overhaul	7.8	4.3	+81
Flying operations	9.9	7.0	+28
Passenger and cargo services	2.0	2.1	−5
Station costs	8.7	4.7	+83
Sales and publicity	3.8	2.9	+31
H.O. administration	3.2	0.8	+300
Aircraft standing charges	3.7	2.7	+37
Totals	39.1	24.5	+60

* B.E.A. results for the 12 months to March 31, 1957.
† Capital results for the 12 months to June 30, 1957.

The results shown in Table VII cannot be taken to indicate that the European airlines are less efficient than those of the United States. Differences in productivity and differences in efficiency are quite separate matters. It can be, of course, that low productivity is indicative of low efficiency but this is not likely to be true in this particular case. Low productivity in airline operations in Europe arises for the most part from conditions which are external to the airlines and over which managements have no control.

The U.S. figures do, however, show the extent of the cost-reducing possibilities which are still open in Europe if steps are taken to enable the productivity level to be raised. The American figures can be regarded as encouraging for Europe's future rather than as an indictment of our current failures.

Despite the very great advantage which the U.S. carriers have over European in the level of operating costs, airline operations in the United States are not without their financial difficulties at the present time. The problems of Capital Airlines are more spectacular than most of the other trunk airlines and have led them to a considerable deficit and the need for a Federal subsidy. But all the major carriers appear to be facing considerable difficulties in financing their future equipment programmes and have used this as an argument for asking the Civil Aeronautics Board to approve substantial fare increases. Their line of argument is not that the new equipment can or ought to be financed out of earnings but that the present level of profits is inadequate to attract new capital on the scale required by the industry. It has been estimated that the U.S. airlines will need to raise about $375 million in the capital market in the next few years; an amount almost equal to the present market value of the whole industry's common stocks.

The difficulties of the raising of new airline capital in the United States arise from two important aspects of the economic state of the industry. The first is the critical relationship between return on capital and the operating ratio. The air transport industry is characterized by a relatively high rate of capital turnover. Despite the very high cost of modern aircraft the ratio of annual revenue to capital employed is much higher in the airline business than many other industries, particularly other forms of transport. In circumstances in which government economic regulation of the industry, directly or indirectly, has the effect of keeping the return on capital at a fairly low rate it is inevitable that the operating ratio in the industry (the ratio of revenue to expenditure) will always be critical and will allow only a small margin of revenue over expenditure. This, combined with the somewhat uncertain nature of the business, means that the airlines always work on a small and very insecure profit margin. It is this aspect which makes them a rather unattractive investment for private capital.

The U.S. airlines are arguing that they must be allowed much higher profit-margins to attract new investment and to this end they have asked for fare increases of up to 20 per cent.

The dilemma here is that the demand for air travel may prove to be as elastic in response to these fare increases as it has proved to be in the past in relation to fare reductions. And even if the market does not actually contract it is difficult to believe that it will expand as rapidly at the new fare level as it has done in the past few years. This rate of expansion may be a critical factor, for the re-equipment programmes of the airlines are all based upon a continuation of past trends of traffic development. Could it be that in order to raise the money for their new equipment the airlines are obliged to take steps which will result in their not wanting the new equipment or at least not so much as they now have on order?

The second aspect of the current economic situation is the question of whether the industry can really afford the present rate at which it is planning to undertake a complete technological revolution.

Too much current thinking seems to be along the lines of a recent American report which says that the only alternative to the jet revolution "is to admit that America, with the world's richest economy, can afford but a second-rate air transport system." The alternative may be to recognize that occasions do arise in the course of economic history in which technological development is so rapid that it can make all investment unprofitable and, by paradox, lead to stagnation rather than rapid progress.

Such situations surely call for some measure of investment planning within the industry concerned. The future progress of the European air transport industry would be better assured if the airlines were now engaged in a joint study of their future equipment programmes and were seeking to avoid the serious economic consequences which might easily arise if jet competition, almost overnight, renders obsolete all other types of aircraft.

The public should not be denied the advances in speed and comfort which technological development is making possible. But, on the other hand, they will not really gain from an uncontrolled development which plunges the whole industry into insolvency.

The foregoing may be summed up as follows:—

(1) Some degree of joint investment planning is a primary requirement for the financial stability of the industry. This could be undertaken through the Air Research Bureau under the direction of its Council of Presidents.

(2) There is still room for a substantial reduction in the cost of operating European air services. This may be achieved by: (a) greater co-operation between the airlines—in fields of activity like ground traffic handling—which need not materially affect their competitive relationships; (b) a continuation of the trend towards an intensification of the route system and more positive joint action on the part of Government to secure this through some form of multilateral route planning.

The Political Framework. The lower average density of European air transport accounts for the large difference in operating costs in this continent compared with the United States. Moreover, the lack of any form of co-ordinated government planning has been a major reason for the extensive rather than intensive way in which the European route structure has developed. Although differences in income levels and differences in the degree of economic and political affiliation are the most important reasons for the variation in rates of development of air transport in Europe and the United States, this does not detract from the conclusion that the most urgent problem in Europe is to find some way of introducing a multilateral system of route planning.

It seems certain that a new spirit walks in Europe and that a fundamental presumption of various plans for economic and political integration is that economic nationalism should be abandoned. There is, as yet, little sign that such nationalism has lost any of its influence in shaping air transport policies. The discussions at the European Civil Aviation Conference both at Strasbourg in 1955 and at Madrid in 1957 disclosed that many of the member-States are, as yet, unwilling to give up the idea that they should be allowed to protect, by restrictive practices, the commercial interests of their own national airlines.

No progress can be made towards a more satisfactory economic future for European air transport by arguing that we should have "freedom of the air" comparable to the freedom of the sea. Nor is it useful to talk about the benefits of competition in the nineteenth century *laissez-faire* sense of the term. A liberalization of attitudes and a more competitive spirit may both be highly desirable in the regulation of European air transport, but it appears to me that there might be many ways in which freedom of the air could have very adverse effects upon air transport progress.

The operation of scheduled air services is by its very nature a duopolistic or oligopolistic business and some form of economic regulation is essential if there is to be any stability. This is the fundamental justfication for the sort of economic regulation which has been adopted in the United States and is the *raison d'être* of the Civil Aeronautics Board.

What is needed in Europe is a system of regulation which, within the restrictions of national sovereignties, will reproduce to the greatest possible extent the economic planning function which the C.A.B. exercises in the United States.

In an article in *Interavia* about a year ago M. Max Hymans, the chairman of Air France, proposed that Europe should in fact set up an Air Transport authority which, he explained, would bear a strong resemblance to the U.S. Civil Aeronautics Board.

But a supra-national solution to the air transport problem is not yet a practicable step. Europe should, at this stage, set up an Air Transport Commission with mainly advisory functions. In *The Economics of European Air Transport* I described how this Com-

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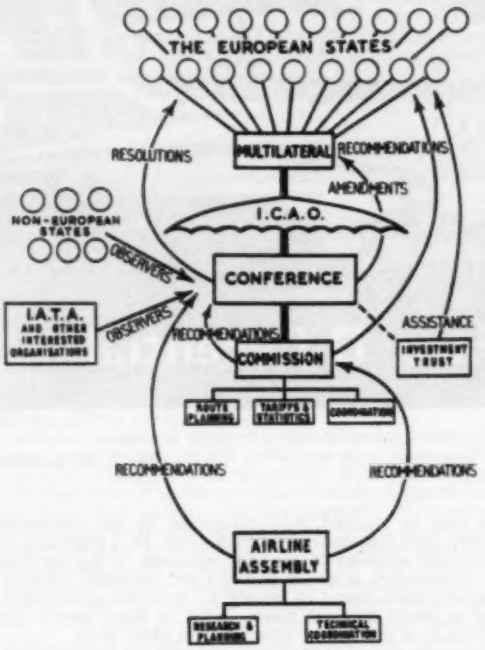

Fig. 2. Suggested regional organization for European air transport.

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mission could work, and reproduced in Fig. 2 is the diagrammatic layout showing the main features of my proposal for a regional organization for European air transport. The major points in the scheme are that the proposed Air Transport Commission would be an agency of the already existing European Civil Aviation Conference. The Commission would be brought into being by a European multilateral air agreement which could be further amended and added to by resolutions of the Conference. The multilateral would, in fact, become the statute book of European air regulation and the Conference would be the Parliament which made the laws. This flexible arrangement seems to have many advantages, not least that it would allow a start to be made in the study work of the Air Transport Commission without having to wait for complete agreement between the states on the precise nature of the system of economic regulation which might eventually be adopted.

The main functions of the proposed Air Transport Commission would be: (1) The study of European traffic-flows and the preparation of plans for a more rational pattern of routes. (2) The consideration of I.A.T.A. agreements on the level of fares and rates with a view to forming an independent and Europe-wide opinion on their desirability. (3) The collection and publication of statistical and financial data on European airline operations. (4) The general co-ordination of various government activities already going on in Europe, e.g., facilitation and telecommunication work.

In all these fields it would be the responsibility of the Air Transport Commission to make recommendations to the European Civil Aviation Conference and also directly to member-governments. In the course of time these recommendations should come to have considerable force and, like the Air Transport Advisory Council in the United Kingdom, the Commission's *de facto* powers would become much greater than advisory.

My proposed Air Transport Commission would be an agency manned by specialist personnel and in no sense a representative body. No question of the position of individual States therefore arises in connection with the Commission. The place for State representation would be the Civil Aviation Conference and major issues like amendments to the Multilateral Agreement would have to be made by unanimous vote. Other lesser matters could no doubt be settled by majority vote.

The whole question of how European air transport may be regulated in the future is dependent upon the basis on which the authority would allot European routes. Economic efficiency could become accepted as the criterion of allotting routes and services. This is the major change which is now beginning to influence European thinking in all its various schemes for economic integration. It is no more revolutionary a thought that some of the nations of Europe will eventually allow their own national airline to go bankrupt than that the nations of the Common Market accepted this possibility for much more major industries when they signed the Rome Treaty. Once this change in thinking has secured its place in European economic affairs the problem of regulating the future of the air transport industry will become a great deal easier.

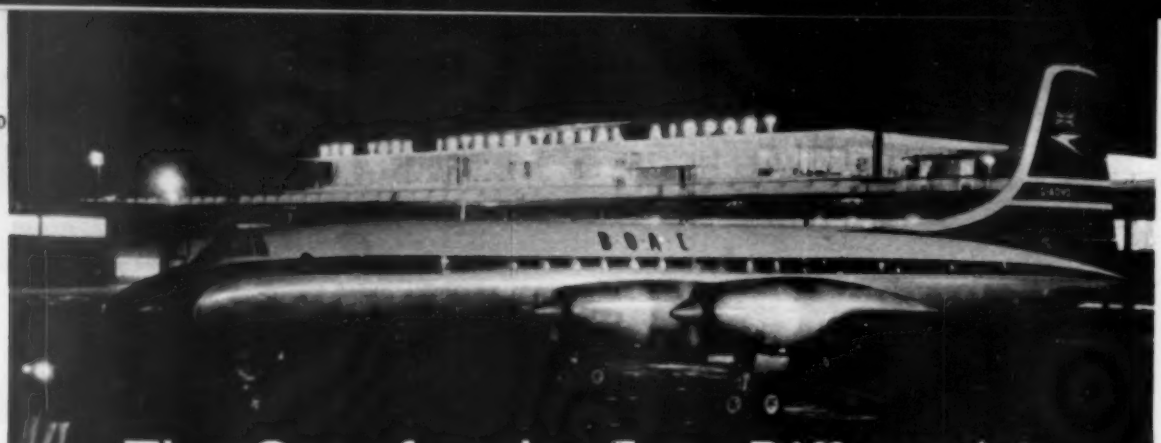
No doubt it will be many years before this happens and before, for example, the British will come to accept that if a cheaper and more efficient service from London to Rome can be provided by a German airline, then the British one ought to go out of business. But this sort of question is not likely to arise for many years. Our primary problems of economic regulation are: (a) to eliminate those protective practices which at present restrict the capacity that airlines may offer on the routes which they are already licensed to serve; (b) to direct the future expansion of European air traffic into a more intensive system of routes and thus enable the productivity of the airlines to be raised.

These are quite modest objectives but they are of fundamental importance to the progress of the air transport industry.

In European air transport affairs (as in other matters) it is easy to look back over the past few years and to bemoan the slowness of the rate of progress towards a more rational regulation of the air transport industry. But it is very encouraging that on the government side there has been the establishment of the European Civil Aviation Conference and, on the airline side, the creation of the Air Research Bureau. Both the E.C.A.C. and the A.R.B. have, in small ways, made important contributions to the better organization of the industry. Moreover, they form a firm foundation on which further developments may be based.

What is needed in approaching the regulatory problems of European air transport is new enthusiasm, a ban on words like "liberalization" which have more emotional than economic connotations, and a willingness to seek solutions which are aimed solely at creating a financially sound and rapidly expanding air transport industry.

The untapped potential: Any fine week-end or evening at London Airport Central brings hundreds of onlookers to this focal point of European air transport operations. Many succumb to the magic of the scene and resolve there and then that their next holiday must be on the Continent—and by air. But "can I afford the fare?" is always the big question-mark.



The Case for the Fare Differential

DISCUSSION OF A CONTROVERSIAL AIR TRANSPORT TOPIC

By J. M. RAMSDEN

"YOU pays yer money," runs the old Cockney music-hall doggerel, "and you takes yer choice." In air transport, as in all forms of business, it is as simple as that: you pay for things according to their quality.

Surprisingly, the scheduled air transport industry took 30 years to apply this rudimentary law of economics. It is barely a decade since Capital Airlines introduced the first coach-class services, and only eight years since PanAm ran the first overseas tourist-class flights between the U.S.A. and Puerto Rico.

Today you can take your choice from four classes of trans-atlantic air travel, and from two or three classes of service in Europe. The world's airlines, in order to widen their custom, have accepted an important principle—to wit, the differential pricing of different standards of quality.

So far, the measures of quality have been determined by the extent to which existing standards of physical comfort, leg-room, food and frills could reasonably be reduced.

Sooner or later, as tentatively discussed in last year's edition of this special issue of *Flight*, the airlines will have to accept the differential pricing of a new measure of quality—speed. Already, wherever members of the air transport industry foregather, the question of a fare-differential between jet and turboprop comes up for discussion. To the jet protagonists, the issue brings foam to the mouth; to the turboprop supporters, and to the operators of first-line piston-engined fleets, the issue provides a soothing source of hope for the future. So far as the actual consumers of air transport are concerned, the public is as yet hardly aware of the possibility that many airlines may very soon be willing—though unable—to charge them less for a slower journey.

Clearly discernible is a trend in air transport towards a bifurcation of speed. There will always be a demand for higher speed, because there can be no arresting technological progress. If Britain does not introduce supersonic transport in the mid-sixties, America will; and if America does not, Russia will. And no doubt the day will come when the public can fly to New York in hypersonic boost-glide rocket transports. But there is already resistance to speed competition for speed's own sake, because air transport's biggest new markets are not to be found among people who want to get from A to B faster. The people (and goods) which the airlines need to carry for their future prosperity are those now travelling by surface; for them a tenfold increase in speed is a sufficient attraction, provided the price is right.

There will eventually be two basic speed-levels; and there must *ipso facto* be two basic fare-levels if the air transport industry is to avoid financial strain. Technical progress ought not to commit the whole industry to frenetic depreciation programmes which prematurely commit good aeroplanes to the scrap-heap. It is a point of view that, during the next few years, disposed-of fleets may be rescued from retirement by the non-scheduled industry, with consequences which might be a repetition of the fare-cutting activities of the U.S. nonskeds in the late forties.

It is probably accepted that the air transport industry will eventually come round to pricing its ton-miles according to the speed at which they are flown. What so many people want to know today is how soon "eventually" is likely to be.

Those who would most like it to be soon are the manufacturers and operators of turboprops. The manufacturers—Bristol, Vickers, Lockheed—view the fare differential as a powerful sales-stimulant for the Britannia, Vanguard and Electra. The operators view the differential as the means whereby they can make money in competition with jets. The manufacturers, unfortunately for them, are helpless onlookers; all they can do to further the cause of the differential fare is to build aeroplanes which they believe will make such a fare possible, and hope the airlines will see sense. Even more unfortunate for the turboprop manufacturers is the fact that most of their customers have either bought jets or are shopping for jets, simply to meet the competition of speed. The prime examples of airlines which have thus backed themselves both ways are, of course, B.O.A.C. and B.E.A.

The future operators of turboprops are frankly pessimistic about any early agreement within I.A.T.A. of a fare-differential. The opposition which would be ranged against them is so formidable, comprising as it would almost every leading I.A.T.A. airline, as to deter even a move to put the subject on the agenda. Obviously those airlines which have invested heavily in jets would regard the fare-differential as an unfair premium upon jet travel.

But the very fact that the subject is capable of arousing hostility is a sure sign that it will eventually get a hearing. There are, indeed, powerful arguments in favour of raising the issue in I.A.T.A. without delay. We might now review these arguments, and consider the way in which they could be voiced.

The most powerful argument for the fare-differential is that lower-quality service—and speed is a quality—should be marketed at a lower price. This principle of pricing according to quality has already been accepted by the industry (incidentally, under the compelling influence of the U.S. Civil Aeronautics Board). The argument that the fare-differential should be allowed because turboprops—or piston airliners—produce c.t.m.s. at a lower cost than comparable jets should, however, be carefully handled. This may be true, and no doubt much evidence can be marshalled to prove it (e.g., the Rand Corporation Report, the Brancker Lecture by Lord Douglas of B.E.A., and many independent—and biased—studies). But the jet v. turboprop cost controversy has proved, if it has proved nothing else, that the jet-supporters can give as good as they get when

Above, turboprop Britannia; left, jet Comet. Should there be a differential in the level of fares?

Every airline operating turboprops is worried about filling its seats in competition with jets. This is the tourist interior of the main cabin of the first of C.P.A.L.'s five Britannias, which was handed over to the airline at Belfast on April 1.

it comes to arguing costs—even if speed is sometimes slipped twice into the calculations. Operating experience alone will decide this issue: in the meantime the case for the differential fare should be argued upon the premise of differential quality. There can be no logical counter to an already accepted principle of airline economics.

A further powerful argument for the fare-differential is the relief which it will provide to an industry which, largely because it is so overloaded with capital and depreciation costs, is for ever flying into a financial headwind. A fare-differential, in providing the means by which slower fleets can compete with jets, would tend to lighten the burden of obsolescence. The industry does not want to be indefinitely committed to a policy of prematurely time-expiring perfectly good equipment, a policy which can hardly be expected to enlist sympathy for the small profit-margins which the airlines always bemoan.

A probable immediate effect of a fare-differential would be to stimulate fresh interest in the turboprop as a *potentially* low-cost form of transport. The supporters of the jet will never concede that the turboprop transports already designed will be cheaper than jets to operate. But they probably will concede that if an aircraft designer were set the task of producing a transport for which low cost, and not speed, was the paramount requirement, he would choose turboprop propulsion. It is probable that the design speed of the new generation of turboprops has been pushed too high for optimum economics; that, in a pointless attempt to compete with jets, power has been devoted to 400 m.p.h.-plus cruising rather than to carrying-capacity at a relaxed, energy-conserving 300 m.p.h. So far there has been little incentive to build such aeroplanes, the AW.650 being the only attempt to guide the air transport industry into the "slow but fast enough" approach to business. It will be sad for the operating industry, and bad luck on its consumers *and* its suppliers, if the opportunity for this kind of business, over all stage-lengths, is by-passed.

A final argument for the differential might be that it would revive flagging interest in the new turboprops, two of which are British. This may be so, but it is an argument which should be discreetly deployed. The fare-differential must not be regarded as an aircraft sales-promotion stunt.

So much for the arguments. How can the differential be implemented? Without any doubt, the two airlines which can give the necessary lead to I.A.T.A.—a lead which we believe would be followed with relief by more airlines than might at first sight be imagined—are B.O.A.C. and B.E.A. The two Corporations—thanks to an indulgent Government—are more heavily committed to jets as well as to turboprops than any other airline. (B.O.A.C.'s long-term capital liabilities alone are double those of PanAm, the next most heavily committed airline.) Both Corporations will, during the years immediately ahead, find it increasingly difficult to fill their turboprop capacity in competition with jets. But at the moment, comfortable in the prospect of big jet fleets, both seem unmindful of the opportunity which they can jointly grasp to further the cause of the differential. To say that I.A.T.A. would never allow it is unworthy of the two airlines which comprise an influential non-American membership of that institution. I.A.T.A. must not be pulled down or defied; without I.A.T.A. international air transport would be ruled by the law of the jungle. But it is the servant, not the master, of its members, and it has stood the test of issues perhaps as contentious as that of the fare-differential.

Such is I.A.T.A.'s position, however, that no airline can hold sway in its councils without the full support of its national government. If it were made clear that B.E.A. and B.O.A.C. had the full mandate, if not the plain directive, of the British Government, the fare-differential would eventually be implemented, even if it meant that the Government for a time had to stand forth alone for its principle, as did the American Government over the economy-fare issue. It is important to remember that the American C.A.B., hitherto I.A.T.A.'s most respected monitor, could not with equity oppose a fare-differential based on speed, since the C.A.B. has itself always adumbrated a policy of price-according-to-quality.

The precise form of the differential, once the principle of its adoption is accepted, would be a matter for debate within I.A.T.A. The scale, as initially proposed, should amount to no more than, and probably less than, a five per cent fare reduction for propeller-driven transports, on routes served by jets. It would be a class-for-class differential, and it would probably be applied according to a scale diminishing with stage-length. This would not be sufficient materially to divert traffic from jets, whose greatly superior comfort and speed would always be worth five extra dollars in ninety-five. But it might be sufficient to tap some new "propeller" traffic, because few air transport markets are so saturated that they are inelastic to even small fare-reductions. The response should be sufficient at least to cover the increased break-even load factors which would result from a lower revenue rate. Whatever may be said about relative operating costs, there is no doubt that turboprops and piston-engined airliners should be able to carry reduced fare-rates without greatly reduced profits. A fare-differential will not make them big money, but at least it will allow them to stay in business—which will not be possible if there is a parity of fares.

The differential will not provide any quick solution to the problem of how air transport can remain economically healthy in a climate of rapid technological progress. But its most important effect will be moral rather than material: its adoption even on a limited scale will encourage the whole industry to reassess its values, and to consider the advantages of a prosperity in which the ideas of really low-cost haulage and mass air transport production can flourish. There will always be a demand for both jets and turboprops; and it is within the power of the airlines to see that the best is made of both forms of propulsion. But the lead must come from B.O.A.C. and B.E.A., and they must have the full backing of the Government.

The jet v. turboprop fare controversy is international; here are the first American champions of the rival philosophies. Above, prototype and first production Boeing 707; below, turboprop Electra.

Equipment for Air Transport

OFF WITH THE OLD, ON WITH THE NEW

By A. T. PUGH

TO look back upon the British aircraft industry of only a year ago is to see a picture surprisingly different from the one presented today. In April 1957 the home market—the national Corporations upon which the industry has always relied for its first sales—had still to decide about its equipment needs for the 1960s, although it was clear that a medium jet for B.O.A.C., and a short-haul jet with which B.E.A. could meet the mounting challenge of France's merchant venturer Caravelle, would need to be included on the Corporations' next shopping list.

At a first glance, indeed, competition from foreign equipment in May 1957 appeared almost overwhelming. Apart from an unrivalled turboprop offering (Britannia, Vanguard and Viscount) in each of the three broad classifications of airliner range, the British industry's foothold in the jet market appeared slender indeed. Boeing and Douglas, bursting with sales energy and displaying great confidence in their ability to meet the tight schedules they had set themselves, had sold their big jets at a rate and in numbers that needed an occasional hasty recalculation of the capacity required in the 1960s for reassurance that the market was not already saturated. The first medium jet—the shapely Convair 880—had already been ordered in a fair quantity by three operators and Boeing's 717 (now 720) seemed assured of a market. And rumour surrounding the DC-9 and Boeing 727 suggested that the West Coast's ideas for short-haul jets were well advanced.

Now, a year later, the sales emphasis has swung from across the Atlantic to Europe. In the U.S., United Air Lines became the first—and so far the only—operator to buy Boeing 720s; and Capital, to the accompaniment of expressions of astonishment (in view of their poor financial position) signed for 15 Convair 880s. Yet apart from these first excursions into the medium-jet field, the American market was quiet in 1957; the big-jet buying spree is over and the airlines are nursing their immense headache as to how to foot the instalments on the bill. It is to Europe that they can now look for the new pattern of jet transports that is emerging; to France for the first of the short-haul jets that established that pattern, and to Britain for the new shape of aeroplane that betokens the advent—even before the first of the underwing podded jets are in service—of a new generation of jet transports.

After the stormy controversies surrounding the British aircraft industry over the past months it is easy to overlook its contribution to the world airliner market. There have recently been revealed two designs from the project offices of U.K. manufacturers that, taken together, are comforting evidence of the nation's continued design virility. The first is the medium jet with North Atlantic range, a design exercise that at the first attempt (a brief fourteen months before) had been called "very difficult" and was later almost thankfully abandoned.

The other pace-setting design is the specialized short-haul jet. The characteristic rear-engined configuration may stem from the Continent, but adoption of a three-engined layout (an arrangement shown, incidentally, by all three firms tendering for the B.E.A. order and designing to the Corporation's specification) stamps the D.H.121 as being of a new pattern again.

Thus in twelve months, the still unfamiliar shape of the underwing-podded American civil jets has been supplemented by the "European" line: a clean wing, straight tapered and swept at about 35 deg, and rear-fuselage-mounted engine pods. The American challenge which a year ago seemed so formidable has been reduced to life-size by the diminishing perspective of progress. The familiar game of technical leapfrog is being played out on the high subsonic speed plateau and the contestants are jockeying to provide the most tempting specification at the moment the airlines want to buy.

It appears at present that delivery of the new de Havilland short-haul jet to B.E.A. in 1964 leaves U.S. West Coast manufacturers with ample scope for delivery date undercutting; Boeing and Douglas are telling the airlines that their 727 and DC-9 could probably be delivered in 1961. If experience has taught us anything, it is that American manufacturers have a fine record of keeping delivery promises. With break-even quantities depending now upon the production of 70-80 aircraft (any significant reduction would price the product out of the market), the prospect of too many manufacturers competing for the orders of too few airlines—and only about half-a-dozen carriers are in any position to develop new aircraft—is a sombre one.

This year will be remembered as the one in which the airlines stood, like eager yet hesitant swimmers on the edge of a bathing pool, awaiting their first plunge into full-scale jet operations. The exercise has been tried before and found to be very promising, and in turboprop operations early promise has been richly fulfilled. Yet the future historian may find it necessary to remind his own generation that in 1958, when orders had been placed in the Western world for no less than eight types of jet, only two new turboprops—the Vanguard and the Electra—were on order.

The passenger appeal of the pure jet's speed and the airlines' reluctance to offer one fare for fast journeys and another fare for slow is discussed on pages 520 and 521; but it is abundantly clear that the differential fare issue is the stumbling block in the way of turboprop development. For the carriage of freight, the same arguments do not, of course, apply; and the turboprop A.W.A. Freightercoach appears, by virtue of its present potential monopoly of an expanding market, to have an important future. The design is made much more valuable and its appeal enhanced by the offer of a variety of configurations at an early stage in the development of the type, since the choice of optimum fuselage size is perhaps the most critical early design decision to be made. The Lockheed 282A, civil version of the C-130A Hercules, is obviously restricted in this respect, and it is probably rather too large an aircraft for widespread civil operation at present.

Before dismissing the differential jet/turboprop fare issue, it seems worthwhile to ponder a little longer upon the effect that reduced fares for turboprop travel might have upon the pattern of airline equipment. Undoubtedly the present trend is away from turboprops on the heavily contested passenger routes. There is, for example, no new turboprop design (apart perhaps from Republic's Rainbow) contemporary with the D.H.121 or the VC.10; nor has an advanced Britannia or a replacement yet been offered to the airlines. But if differential fares were introduced in time for the Britannia, Vanguard and Electra to take advantage of them, there would be an immediate demand for a follow-up design of turboprop, particularly one of very large capacity (to gain the utmost from the low class of fares) and of considerable range (to use the turboprop's economy to best advantage and offer non-stop services over ranges that the jet could not match).

There is only one aircraft in the world that approaches this specification today, and that is the Tu-114. It has immense capacity, promises considerable range and is undoubtedly very fast—perhaps beyond the point where it is a good turboprop and approaching that where it is a bad jet.

It would thus be idle to overlook the fact that a tussle for differential fares (of as much value to the turboprop airlines as the travellers that they carry) might raise unwanted political issues. It would be droll indeed if a Russian operational—or even sales—breakthrough were to turn upon this controversy, but it is not unduly rash to predict that Aeroflot applications for traffic rights across the Western world are not so far away; nor is considerable sales effort in the West by Russia's manufacturers. Even if the Tu-110 is dismissed as being unlikely to approach U.S. or European jet economy, the Russian challenge with Tu-114, Il-18 and An-10 turboprops is a very real one.

It is easy enough, in discussing trends in air transport equipment, to forget that only the most modest amount of traffic is yet carried by turbine-engined aircraft, however quickly the emphasis may change in the next few years. It is a sobering fact that numerically about thirty per cent of the world's transport total air fleet consists of DC-3s. If re-equipment provides a headache for major airlines, for many smaller ones the problem presents a complete impasse. There is no general solution, and no single DC-3 replacement. For many smaller and poorer airlines the DC-3 replacement really *is* the DC-3; and the rising engineering costs will have to be offset as best they can by end-of-the-line disposal

[*Continued on page 523*

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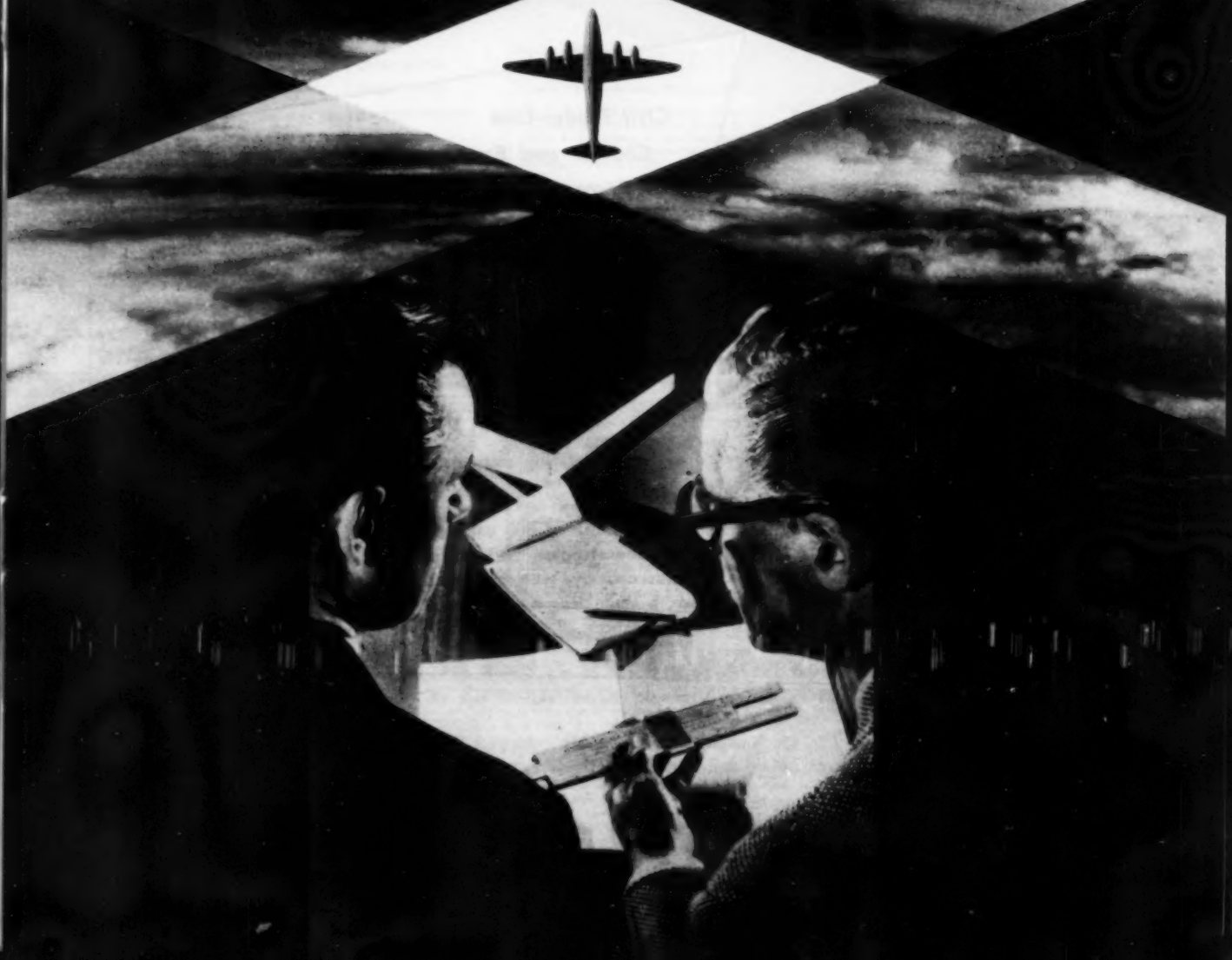

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EQUIPMENT FOR AIR TRANSPORT . . .

of other Dakotas and spares. (B.E.A.'s 46 aircraft will be welcome equipment for someone.)

Alive to the trend for aircraft to filter down from major trunk lines to minor trunk lines, to local service carriers and to non-scheduled operators, Vickers introduced during the year a version of the Viscount tailored to local service needs. Although no orders for the V.790 have yet been secured, the general equipment reshuffle that will start when the big jets go into service has not yet really begun. When it does so, the redistribution of equipment will be one of the most fascinating aspects of the air transport scene (it is for this purpose that regular publication of *Flight*'s Airliner Census has been introduced), since this game of transport musical chairs should offer many carriers the chance of carrying through major re-equipment programmes with secondhand aircraft. This is the time, too, when re-engining programmes will be implemented; and Napier in particular are set for brisk business with the Eland conversion of Convairs.

The air transport industry, after nearly 40 years of propeller-driven transport operation, stands on the threshold of its greatest equipment revolution. The effects of this will be felt not only by the world's major trunk route carriers, but to some degree by every operator listed in the following pages. A year ago we wrote that the greatest contribution by the British manufacturing industry to the years following the demarcation of 1958 lay in the excellence of its engines. Now, and for the better, the scene has changed; the industry is rapidly acquiring commercial experience and is prepared to challenge the world's airframe manufacturers on better than equal terms.

THE AIRLINES' SHOPPING LIST

(Correct to April 18, 1958, excluding options, but including certain government and executive orders)

Aircraft	Variant	Powerplant	Airlines (listed in order of purchasing)	Total
Douglas DC-8	Overseas or Long-Range	Pratt and Whitney JT4	PanAm, 21 (December 1959); United, 18 (mid-1959); K.L.M., 8 (March 1960); Eastern, 20 (mid-1959); J.A.L., 4 (September 1960); S.A.S., 7 (March 1960); Panagra, 4 (February 1960); Swissair, 3 (March, June, October 1960); U.A.T., 2 (March, April, May 1960); T.A.I., 2 (June 1960); Olympic, 2 (1960); Trans-Caribbean, 1; Alitalia, 4 (summer 1960)	138
	Domestic	Rolls-Royce Conway	T.C.A., 6 (March 1960)	
	Domestic	Pratt and Whitney JT3	United, 22 (May 1959); National, 6 (August 1959); Delta, 8 (June 1959)	
Boeing 707	120	Pratt and Whitney JT3	PanAm, 6 (December 1958); American, 30 (operation on March 15, 1959); Continental, 4 (May 1959); T.W.A., 15 (from April 1959); Qantas, 7 (May—September 1959); S.A.A., 3 (from July 1960)	153
	220	Pratt and Whitney JT4	Braniff, 5 (October 1959)	
	320	Pratt and Whitney JT4	PanAm, 17 (March 1959); Air France, 17 (November 1959); Sabena, 4 (December 1959); T.W.A., 18; Cubana, 2 (March, June 1960)	
	420	Rolls-Royce Conway	Lufthansa, 4 (summer 1960); Air India, 3 (early 1960); B.O.A.C., 15 (1960); Varig, 3 (July 1960)	
Boeing 720	—	Pratt and Whitney JT3	United, 11	11
Bristol Britannia	102	Proteus 705	B.O.A.C., 15	78
	250	Proteus 755	R.A.F. Transport Command, 20; M. of S., 3	
	300 series	Proteus 755	M. of S., 1; Northeast, 5 (mid-1958); Aeronaves de Mexico, 2	
	310 series	Proteus 755	B.O.A.C., 18 (current); El Al, 4; C.P.A.L., 6 (Spring, 1958); Hunting-Clan, 2; Cubana, 2 (late 1958)	
Douglas DC-7C Seven Seas	—	Wright R-3350	PanAm, 25; Swissair, 5; S.A.S., 14; Sabena, 10; Braniff, 7; B.O.A.C., 10; K.L.M., 11; Northwest, 14; Panair, 4; T.A.I., 3; Alitalia, 6; C.M.A., 4; J.A.L., 4	117
Lockheed L.1649A	—	Wright R-3350	T.W.A., 29; Air France, 10; Lufthansa, 4	43
Convair 440 Metropolitan	—	Pratt and Whitney R-2800	R.E.A.L., 10; S.A.S., 20; Finnair (Aero O/Y), 3; Sabena, 12; Swissair, 12; Iberia, 5; Continental, 3; National, 6; Delta, 8; Eastern, 20; Braniff, 5; Alitalia, 2; Jugoslavia (JAT), 2; Lufthansa, 5; Air Carrier Service, 3; R.A.A.F., 2; U.S.A.F., 6; Corporate customers, 12; Karhumaki Airways, 2; Ansett, 7; Italian A.F., 1; Cruzeiro do Sul, 4; Garuda, 3 (spring 1958)	153
Sud Aviation Caravelle		Rolls-Royce Avon RA.29	Air France, 12 (late 1958 to late 1960); S.A.S., 6 (April-October 1959); Varig, 2 (June, November 1959); Finnair, 3 (February-April 1960); Air Algerie, 3 (January-March 1960)	26
de Havilland Comet	4	Rolls-Royce Avon RA.29	B.O.A.C., 19 (mid-1958)	25
	4B	Rolls-Royce Avon RA.29	B.E.A., 6 (late 1959 to spring 1960)	
Lockheed Electra		Allison 501	Eastern, 40 (October 1958); American, 35 (January 1959); Braniff, 9 (May 1959); National, 23 (April 1959); K.L.M., 12 (September 1959); Western, 9 (September 1959) Allison, 1 (June 1958); Garuda, 3; Pacific Southwest, 3; Cathay Pacific, 2 (June, August 1959); Aeronaves de Mexico, 3	140
Vickers Viscount	700 & 800 series	Rolls-Royce Dart	*See list below*	379
Vickers Vanguard	950 series	Rolls-Royce Tyne	B.E.A., 20 (March 1960); T.C.A., 20 (August 1960)	40
Vickers VC-10	135 seats	Rolls-Royce Conway	B.O.A.C., 35 (1963)	35
Convair 880		General Electric CJ-805	T.W.A., 30 (late 1959); Delta, 10 (1959); Transcontinental, S.A., 4; R.E.A.L., 4 (late 1959); Capital, 15 (September 1960)	63
Fokker F.27 Friendship	Fokker-built	Rolls-Royce Dart	K.L.M., 2; Aer Lingus 7 (late 1958); T.A.A., 6 (early 1959); Dutch Government, 1; R.I.V., Turin, 1; Braathens, 3; Australian Government, 2; Iranian Oil, 2; Trabajos Aereos y Enlaces (Spain), 3 (spring 1959); Philippine Air Lines, 2 (late 1959); Sabena, 12; Belgian Air Force, 6; Aviaco, 6 (May-November 1959)	114
	Fairchild-built		West Coast Air Lines, 6 (Spring-October 1958); Mackey, 4 (Spring 1958); Frontier, 4 (October 1958); Bonanza, 6 (May-June 1958); Piedmont, 12 (April-October 1958); General Tire and Rubber, 1 (1958); Continental Can Co., 1 (1958); Quebecair, 2 (August-September 1959); other U.S. executive versions, 10; Aerovias Ecuatorianas, 1 (November 1958); Northern Consolidated, 3 (October 1958-April 1959); Southwest Airlines, 3 (September-October 1958); Wheeler Airlines (Quebec), 2 (February-March 1959); Avensa, 5 (July 1958-January 1959); Wien Alaska, 3 (February-April 1959); Butler Aviation, 1 (exec., 1959); Bank of Mexico, 1 (exec., 1959); L.A.V., Venezuela, 6	

VISCOUNT ORDERS

Vickers-Armstrongs Viscount (all models). The following list of confirmed orders accounts for 379 aircraft, as follows: B.E.A., 27 V.701 (Dart 505), 24 V.802 (Dart 510), 18 V.806 (Dart 520); B.W.I.A., 4 V.702 (Dart 506), 4 V.772; Aer Lingus, 4 V.707 (Dart 505), 3 V.808 (Dart 510); Air France, 12 V.708 (Dart 505); T.A.A., 7 V.720 (Dart 505/6), 7 V.756 (Dart 510); Indian Air Force, 1 V.723 (Dart 506), 1 V.730 (Dart 506); T.C.A., 15 V.724 (Dart 506); 36 V.757 (Dart 506); Hunting-Clan, 3 V.732 (Dart 506), 2 V.759 (Dart 510)*; Pakistan Government, 1 V.734 (Dart 506); Iraqi Airways, 3 V.735 (Dart 506), 1 V.773 (Dart 506); Fred Olsen, 2 V.736 (Dart 506)**, 4 V.779 (Dart 510)†; Canadian Government, 1 V.737 (Dart 506), 1 V.745 (Dart 506); Misrair, 5 V.739 (Dart 506); Capitol, 3 V.744 (Dart 506), 57 V.745 (Dart 510); Butler Air Transport, 2 V.747 (Dart 506); Central African Airways, 5 V.748 (Dart 510); L.A.V., 3 V.749 (Dart 506); M.E.A., 7 V.754 (Dart 510); Hong Kong, 2 V.760 (Dart 510); U.B.A., 3 V.761 (Dart 510); Hughes Tool Co., 1 V.763 (Dart 510); U.S. Steel Corp., 3 V.764 (Dart 510); Standard Oil, 1 V.765 (Dart 510); Indian Airlines, 10 V.768 (Dart 510); K.L.M., 9 V.803 (Dart 510); Transair, 3 V.804 (Dart 510); New Zealand N.A.C., 3 V.807 (Dart 510); Continental, 15 V.812 (Dart 525); South African Airways, 7 V.813 (Dart 525); Iranian Government, 3 V.782 (Dart 510); Lufthansa, 9 V.814 (Dart 525); Philippine Air Lines, 2 V.784 (Dart 510)‡; Alitalia-L.A.I., 10 V.785 (Dart 510); South African Government, 1 V.781 (Dart 510); Pakistan Air Lines, 3 V.815 (Dart 525); Cubana, 3 V.755 (Dart 510), 4 V.818 (Dart 525); Lanica, 2 V.786 (Dart 510); Kaysam Investment Corp., 1 V.786 (Dart 510); Brazilian Government, 1 V.742, 1 V.789 (Dart 510); P.L.U.N.A., 3 V.769 (Dart 510); Niarchos, 1 V.819 (Dart 525); Black Lion Aviation, 1 V.825; Eagle Aviation, 2 V.805; Turkish Air Lines, 5 V.794; V.A.S.P., 5 V.827; Airwork, 2 V.831.

* The 759s sold to Icelandair. ** Sold to Airwork, Ltd. † Leased to Austrian Airlines. ‡ One leased to T.A.C.A

HOW BIG IS A BIG AIRLINE?

By JOHN SEEKINGS

TO be the world's biggest airline is a title claimed by not a few carriers: Air France claims to be the world's largest airline; B.O.A.C. states that it is "the world leader in air travel." Even within the United Kingdom violent arguments rage as to which is the "biggest" British independent operator. How is airline size measured?

Various claimants to the title usually measure their size against one of five yardsticks: number of aircraft, number of employees, extent of unduplicated route network, volume of traffic carried or volume of capacity provided. There are other standards such as the value of capital locked up in the airline or total annual revenue, but the value of these is somewhat impaired by the vagaries of currency exchange rates.

The number of aircraft in a fleet is probably the least significant measure of its size. But airlines boasting fleets of over 100 aircraft must have some claim to be big. Such a club would recruit its members from the following list: American (206), T.W.A. (192), United (185), Eastern (154), PanAm (135), Air France (132), B.E.A. (113), Real (Brazil) (110), Capital (105). Not quite eligible would be K.L.M. (92) and Indian Airlines Corporation (92). It is strange that this list is only slightly shorter than that covering airlines with 50 to 100 aircraft: in addition to K.L.M. and I.A.C., this would include B.O.A.C. (83), T.C.A. (79), Delta (79), Sabena (78), Braniff (73), Pacific West (71), S.A.S. (61), LOT (54), Northwest (50) and National (50).

Total employment is probably the most misleading of yardsticks. Some carriers show an annual average figure, others use the year-end total. In some airlines (here unnamed) non-European labour is excluded. Agents are occasionally classed as employees. And where air transport is only one of a company's activities, a break-down of staff is always arbitrary. But allowing for—or rather, over-looking—these complications, it is possible to compose a picture showing the world's airlines placed in order of employment (shown to nearest thousand). At the top comes PanAm (25), then American, United and T.W.A. (each 20), followed by Air France and B.O.A.C. (each 19). There is then a drop to K.L.M. (17), and a further fall to Eastern (14). These eight are the giant employers in the industry. The next ten are S.A.S. and B.E.A. (each 11), T.C.A. (10), I.A.C. (9), Sabena and Capital (each 8), Real (6), Qantas, Delta and North-west (each 6). Of all these, Pan American employs the most pilots (1,720) and Qantas the least (250). The proportion of pilots to total staff ranges from 11 per cent for Capital to 3 per cent for Air France and I.A.C. It is significant that for all the above North American airlines the proportion of pilots to total staff is above 7 per cent, while for all of the other airlines the proportion is below 6 per cent. A typical proportion for the large European carriers is 4 per cent.

Unduplicated route network is an even more arbitrary figure than total employment. Airlines, prompted by publicity depart-ments, tend to interpret the word "unduplicated" in somewhat liberal terms. For instance, one route from London to New York direct and another from London to New York via Boston might provide the basis for an allegedly unduplicated route network of 7,000 miles. U.S. carriers have to conform with fairly rigid C.A.B. definitions: thus PanAm declares a network of 64,000 miles, T.W.A. of 35,000 miles and Eastern (the next biggest U.S. carrier), 17,000 miles. By contrast, the larger non-American operators claim quite astronomical figures (shown to nearest thousand miles): Air France 173, K.L.M. 159, S.A.S. 120, B.O.A.C. 85, Sabena 77, Swissair 72 and Real 70. There is then a sharp drop down to a group of seven carriers (Aerolineas Argentinas, Avianca, B.E.A., Panair do Brasil, T.A.A., T.C.A. and Varig) each of which claim route-networks in the order of 30,000 miles.

The volume of traffic carried is probably the most valid of all standards, and on this basis American stands out clearly as the world's largest airline, closely pursued by United, Eastern, Pan American and T.W.A. Each of these five companies carried about 500 million ton-miles of traffic last year. The largest non-U.S. airline, Air France carried only half this amount (245m ton-miles). Then comes a group of nine carriers, each of which transported between 100 and 200m ton-miles in 1957. Of these, five are in North America (Delta 170m, Capital 157m, Northwest 156m, T.C.A. 147m and National 102m) and four are in Europe (B.O.A.C. 189m, K.L.M. 180m, S.A.S. 127m and B.E.A. 100m). These 15 leaders stand in a class of their own.

Trailing some way behind come four carriers each of which lifted about 75m load ton-miles last year: Sabena (83m), Western (75m), Swissair (71m) and Real (precise figure unknown). There follows another gap between these airlines and a cluster about the 50m load ton-mile mark: Avianca, Alitalia-L.A.I., T.A.A., Ansett-A.N.A. and Mexicana. Below this level come the many airlines that may, in terms of total traffic, be described as "medium-sized."

Volume of Traffic

The size-pattern that emerges from a study of total traffic does not correspond to that for each separate class of traffic. In the case of passenger-miles, the list of the biggest airlines corresponds to that of the 15 "giants," although the order is slightly different. The biggest airline is still American, this company last year becoming the first to carry over 5,000 million passenger-miles in a twelve-month period. Broadly speaking, those airlines (such as Capital) which concentrate on passenger traffic move up a few places on the list, while those which carry a large proportion of non-passenger traffic drop their positions. B.O.A.C. is the seventh largest carrier in terms of total ton-miles of traffic, but lies tenth in terms of passenger-miles, being eclipsed by Capital, Delta and T.C.A. Similarly, K.L.M. drops from eighth to eleventh place.

If airlines are graded according to number of passengers carried, the picture is even more different. In 1957 Eastern just managed to oust American from its leading place, both carriers attracting over eight million patrons to their services. As might be expected, the short-haul airlines here show to best effect. Capital's annual traffic of almost four million passengers brings that airline up to fifth position behind the "Big Four" (American, Eastern, T.W.A. and United). Even more remarkable, B.E.A. comes up to eighth position, its passenger traffic exceeding that of Air France. Con-versely, the long-haul carriers topple. K.L.M. carries slightly under one million passengers in a year while B.O.A.C. does not pick up as much as half a million passengers, its total being less than that for the larger U.S. local-service carriers such as North Central, Mohawk, Allegheny and Piedmont, and only slightly greater than that for Aer Lingus.

When the volumes of airline freight and mail traffic are com-pared, yet another picture of airline size emerges. Here the long-haul carriers gain most in size. In the case of airfreight, American and Pan American dead-heat, each just failing to lift 100m ton-miles annually. Flying Tiger—the U.S. domestic all cargo carrier—was responsible for 83m ton-miles last year (this included 28m non-scheduled traffic), and United came fourth with 67m. Eight airlines carried between 25m and 50m freight ton-miles in 1957. Slick (50m), K.L.M. (42m), T.W.A. and Air France (each 42m), B.O.A.C. (35m), Avianca (estimated at 35m), Riddle (32m) and Ansett-A.N.A. (estimated at between 25 and 30m).

Although the global volume of airmail is only about one-quarter that of airfreight, the rates at which it is carried—usually about four or five times higher than freight rates—ensure that this traffic is highly regarded by world airlines. As overwater international carriers derive particular benefit from mail, the list showing the biggest mail carriers is strangely lacking in U.S. domestic trunk operators. Only twelve airlines carried over five million mail ton-miles in 1957, of which the biggest was PanAm (37m), the others being United (30m), T.W.A. (24m), B.O.A.C. and American (each 20m), Northwest (17m), Air France (15m), Eastern (12m), Qantas and T.C.A. (each 9m), K.L.M. and S.A.S. (each 7m).

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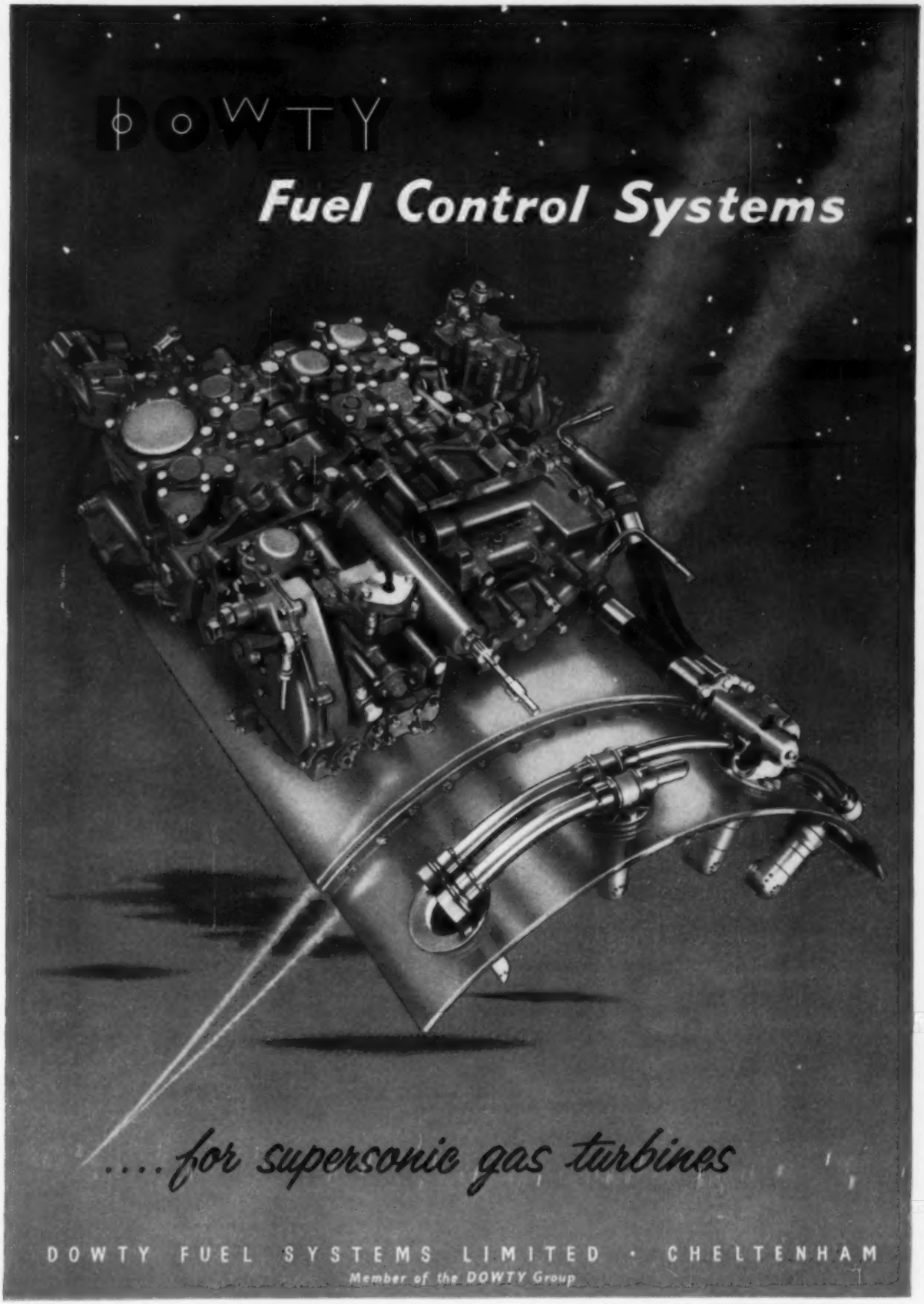
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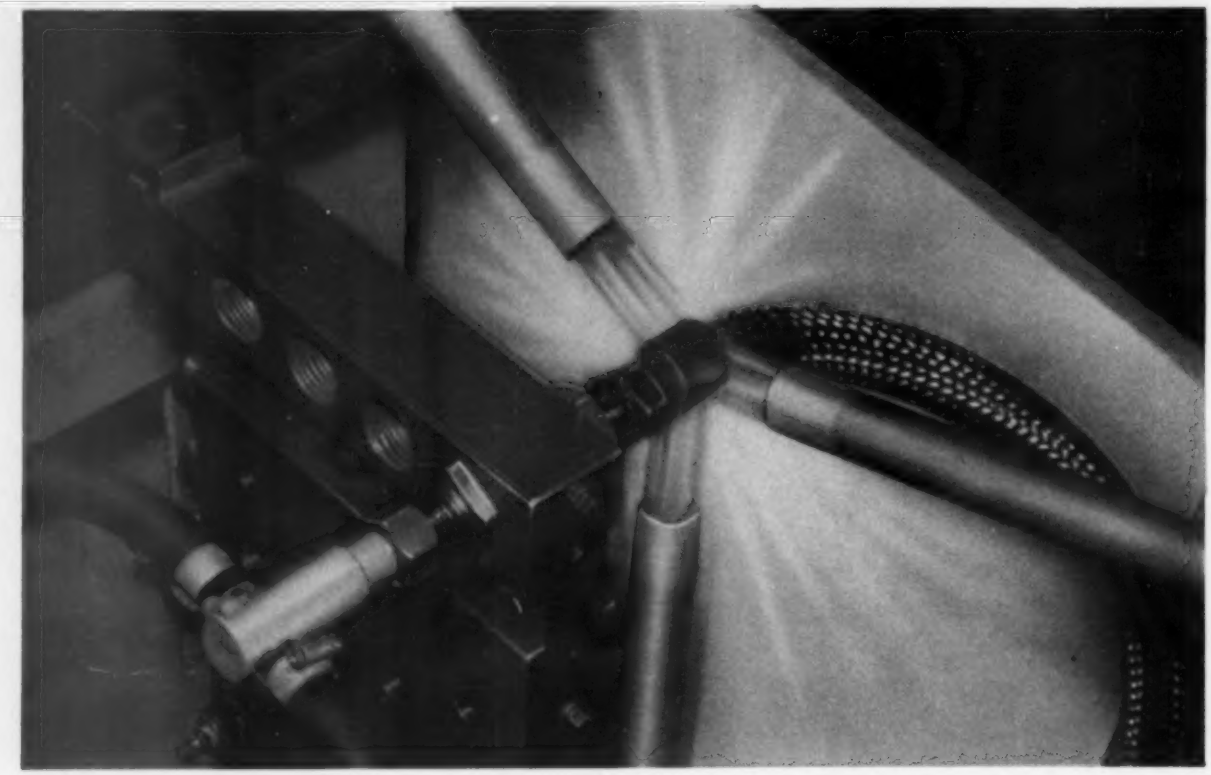

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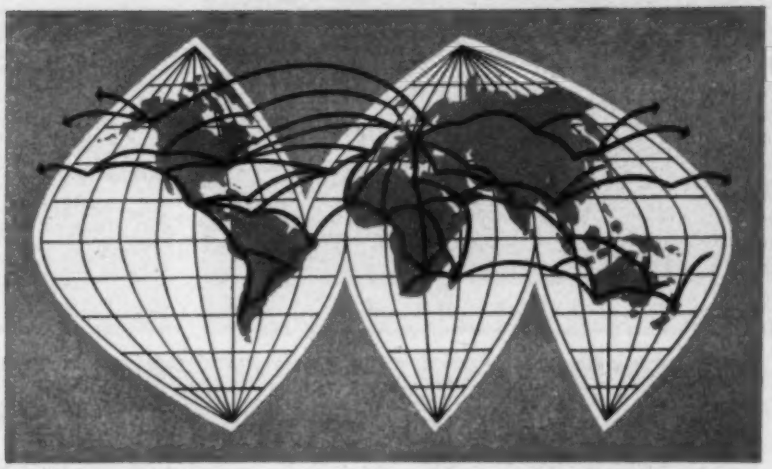
PAL 9

This "Flight" compilation forms a comprehensive guide to the air transport operators of scheduled and unscheduled, international and domestic, passenger and freight services throughout the world. The British Corporations and independent operators are listed below and a separate section, starting on page 528, deals with overseas carriers. On pages 552 to 554 are presented tables of operating results of all scheduled carriers.



WORLD AIRLINE DIRECTORY

The British Carriers

British European Airways Corporation. This has been a busy year for B.E.A., from the viewpoint both of new orders and new routes. From the "handful of jets" that the Corporation intended to buy (the contract for six Comet 4Bs was signed on March 28) to meet jet competition in Europe, the policy swung towards a much more comprehensive jet re-equipment programme. Offered a choice of two short-haul jets by the British industry, B.E.A. remained constant in their favour of de Havilland as jet-transport suppliers and—subject to final approval—a £30m order is to be signed for 24 D.H.121s with an option on a further 12. Delivery will be in 1964, by which time the Corporation's 20 Vanguards will be in full service. B.E.A. has retained its full fleet of DC-3 Pionairs and Leopards, but the Elizabethan fleet will be retired during the summer (except for two aircraft that will be equipped with Rolls-Royce Tynes for development flying preparatory to delivery of the first Vanguard).

In the past few months B.E.A. have made big strides towards opening services with east European countries. Reciprocal services between London and Warsaw with LOT started on April 8 and an interchange of visits with a Russian civil aviation delegation resulted in the signing of an agreement in Moscow on February 26 for the joint inauguration later this year of London - Moscow services by B.E.A. and Aeroflot. During the year B.E.A. acquired a one-third interest in Cambrian Airways and a 25 per cent interest in Jersey Airlines, and in January took over Cyprus Airways' routes on a charter basis.

Financially, 1957-58 may well be the Corporation's best year. A record net profit of £1.2m was achieved in the calendar year 1957 and, despite the largest month's deficit ever in January, B.E.A. are confident of making their biggest annual profit yet.

Board members of B.E.A. are: Lord Douglas of Kirtleside, chairman; Sir John Keeling, deputy chairman; Anthony H. Milward, chief executive; Lord Balfour of Inchrye; S. Kenneth Davies, chairman, Welsh Advisory Council; Sir Patrick Dollan, chairman, Scottish Advisory Council; W. A. Edmenson, chairman, Northern Ireland Advisory Council; Sir Arnold Overton; M. A. C. Ping.

Executive management: C. A. Herring, personnel director; Capt. J. W. G. James, flight operations director; P. C. F. Lawton, commercial and sales director; H. E. Marking, secretary; B. S. Shenstone, chief engineer; R. L. Weir, financial controller; E. P. Whitfield, traffic director; W. Simpson, chief public relations officer; Dr. A. Buchanan Barbour, director of medical services.

Fleet: 46 Pionair/Leopard DC-3, 14 Elizabethan As.57, 25 Viscount 701, 22 Viscount 802, 12 Viscount 806. On order: six Viscount 806, six Comet 4B, 20 Vanguard.

British Overseas Airways Corporation. At the start of the financial year 1957-58, two new aircraft types, the DC-7C and the Britannia 102, were operating respectively on the Corporation's transatlantic routes and on those to South Africa and Australia. Britannia operations suffered various setbacks in the early months and delays to services provoked some sharp criticisms, although the popularity of the type was little affected. But by the end of the year the 102 fleet had settled down and was achieving an average daily utilization of eight hours. The first long-range Britannia was delivered to B.O.A.C. in November and (after a brief tussle with El Al for the honours) the first scheduled turboprop service across the North Atlantic was operated by the British airline on December 19, 1957. As the Britannia is the first British aircraft of any kind to operate scheduled services across the North Atlantic the occasion was a high-spot in B.O.A.C.'s year. Last September, after the delivery of two Comet 2Es, the airline began a period of intensive flying to accumulate RA.29 engine hours, operating almost daily between London and Beirut. By the beginning of this month the two Comets had flown over 2,900 hours. The first Comet 4s are to enter service on the Empire routes next spring, but B.O.A.C. are considering the possibilities of operating them across the North Atlantic in competition with PanAm's Boeing 707s.

In May of last year the Corporation announced its intention of buying a fleet of Vickers VC.10 medium jets to replace its Comets and supplement its Boeing 707s. When the contract for 35 aircraft (and an option on a further 20) was signed on January 14 it proved, at £60 million, to be the biggest single civil order ever placed. The VC.10s enter service in 1963.

In spite of apparently making a profit on its Britannia operations, the Corporation expects a loss on the results of the year 1957-58. This may be as high as £2 million; Sir Gerard d'Erlanger said recently that his earlier forecast of a heavy loss "had proved only too true."

The Corporation's route network remains largely unchanged but an application has been filed with the A.T.A.C. for permission to operate between London and Paris.

Board members of B.O.A.C. are: Sir Gerard d'Erlanger, chairman; Sir George Cribbett, deputy chairman; Basil Smallpeice, managing director; Major J. R. McCrindle, adviser international affairs; J. W. Booth; Sir Francis Brake; H. L. Newlands; Lord Rennell; Sir John Stephenson; Lord Tweedsmuir.

Executive management: Keith Granville, deputy managing director; K. H. Staple, secretary and legal adviser; C. Abell, chief engineer; K. W. Bevan, financial comptroller; G. H. C. Lee, general manager, western routes; J. R. Stainton, general manager, eastern routes; Derek H. Glover, general manager, southern routes; H. C. Spear, chief personnel officer; Capt. J. N. Weir, chief of flight operations; F. C. Gillman, chief Press and information officer; Dr. K. G. Bergin, chief medical officer; Sir Duncan Cumming, managing director of B.O.A.C. Associated Companies, Ltd.

Fleet: 17 Argonaut, 15 Britannia 102, 10 DC-7C, five Lockheed 749A Constellation, 16 Stratocruiser, four Britannia 312. On order: 14 Britannia 312, 19 Comet 4, 15 Boeing 707, 35 Vickers VC.10.

INDEPENDENT OPERATORS

Air Charter, Ltd., was founded in 1947. Scheduled services now consist of the Channel Air Bridge from Southend and coach-air services from London to Calais, Ostend and Rotterdam. The company also conducts trooping flights to Cyprus, and widespread charter operations from its bases at Southend and Stansted. Associated companies are Aviation Traders, Ltd., and Aviation Traders (Engineering) Ltd. Airwork, Ltd. recently acquired a large share in the capital of these companies.

Head Office: 21 Wigmore Street, London, W.1. *Executives:* F. A. Laker, managing director; E. N. Jennings, operations manager; G. W. Forster, commercial manager; D. A. Whybrow, manager Channel Air Bridge. *Fleet:* six York, three Bristol 170 Mk. 31, six Bristol 170 Mk. 32, three DC-4.

Yankee Golf was the first of B.E.A.'s 18-strong fleet of Viscount 806s which are still being delivered. Engines are Dart 520s.

WORLD AIRLINE DIRECTORY...

Air Navigation and Trading, Ltd., is engaged on charter services and flying training at its Blackpool and Middleton bases.
Head Office: Squires Gate Airport, Blackpool. *Executives:* R. L. Whytham, chairman; G. C. Whytham, operations manager; T. J. Franks, chief pilot. *Fleet:* two Avro 19, four Anson, two Rapide, two Dragon, six Auster, four Tiger Moth, three Proctor.

Airviews, Ltd. In addition to charter, pleasure and survey flights, this company operates scheduled services from Manchester to Newcastle, to the Isle of Wight and to Newquay.
Head Office: Ringway Airport, Manchester. *Executives:* J. B. Martin, B. M. Martin, directors. *Fleet:* one Dove, two Rapide, one Auster.

Airways Union, Ltd. Charter flying is only one of many activities, this company also being engaged on component manufacture, aircraft repair, airport management, and running flying schools and clubs.
Head Office: Weston-super-Mare Airport, Somerset. *Executives:* R. King-Farlow, chairman; S. J. Cox, secretary and general manager. *Fleet:* one Gemini, three Auster, four Tiger Moth, one Messenger. On order: two Chipmunk.

B.O.A.C.'s DC-7Cs share the airline's North Atlantic traffic with Britannia 312s and Stratocruisers. The latter are to be progressively withdrawn before the end of the year. Pictured below at London Airport, aircraft of Britavia's Hermes division are based at Blackbushe.

Air Charter have recently supplemented their Channel Air Bridge with coach-air services to Calais, Ostend and Rotterdam.

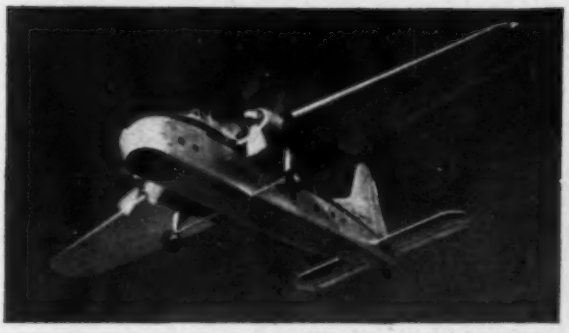
Air Couriers (Transport) Ltd., operate general charter flights and Press and television flying.
Head Office: Croydon Airport, Surrey. *Executives:* C. P. L. Gogsal, F. W. Griffith, directors; K. J. Kelly, chief engineer. *Fleet:* three Rapide, two Gemini, one Oxford.

Air Kruise—see British Aviation Services.

Airwork, Ltd., founded almost 30 years ago, is the oldest independent British airline. Scheduled "Safari" services are operated in conjunction with Hunting-Clan Air Transport to West, East and Central Africa, the Vikings used on these services since 1952 having recently been replaced with Viscounts. Airwork is also the main contractor in the Government trooping service to Singapore. A recently negotiated long-term charter involves regular Hermes services to West Africa on behalf of the Gold Coast Chamber of Mines.
Whitehall Securities, Blue Star Shipping and Furness Withy are major shareholders in Airwork. The airline, in turn, controls Transair, Ltd., and holds a substantial share in Air Charter, Ltd., Fison Airwork, Ltd., Straits Air Freight Express, Ltd. (New Zealand), and Commercial Air Services (South Africa).
Head Office: 35 Piccadilly, London, W.1. *Executives:* M. D. Wyatt, chairman/managing director; R. Loudon Cumming, directory/secretary; Hon. W. K. Davison, general manager; L. R. Castlemaine, sales manager; G. E. Ford, operations manager; K. R. Sangster, traffic manager; L. A. Lafone, general manager technical; A. D. Page, aircraft sales manager. *Fleet:* four Hermes, five Viking, two Viscount, one Consul. On order: two Viscount 813.

Aquila Airways—see British Aviation Services.

Autair, Ltd., conduct all types of charter helicopter operations, their experience including service with Antarctic expeditions.
Head Office: 75 Wigmore Street, London, W.1. *Executives:* W. H. Armstrong, managing director; Capt. L. R. Lord, chief pilot; T. Howie, chief engineer. *Fleet:* three S-51, one Bell 47G-2.



Silver City continue to use their faithful Bristol 170 Freighters on their car ferry services. This is a Mk 32. (Right) One of Dan-Air's four Yorks.

Aviation Traders—see Air Charter, Ltd.

B.K.S. Air Transport, Ltd., conduct scheduled services from bases at Southend, Newcastle and Leeds to Jersey, Isle of Wight, Ostend, Bilbao, Düsseldorf, Belfast and Glasgow. Inclusive-tour services are also undertaken.

Head Office: 1 Marylebone High Street, London, W.1. *Executives:* C. J. Stevens, chairman/managing director; J. W. Barnby, director; H. Spring, manager; J. J. Beer, secretary. *Fleet:* four Dakota, one Elizabethan. On order: two Elizabethan.

Britavia, Ltd.—see British Aviation Services.

British Aviation Services, Ltd., have now become Britain's largest independent carrier, its principal constituent airlines being Britavia, Ltd., and Silver City, Ltd. Britavia has two divisions: the Aquila Airways Division is Britain's only flying-boat operator, and flies scheduled services from the base at Hamble to Lisbon, Madeira and Santa Margherita (scheduled services to Las Palmas and Genoa have been discontinued); the Hermes Division is based at Blackbushe and concentrates on trooping services and inclusive-tours.

The main activities of Silver City Airways, Ltd., are the cross-Channel ferry services (from Ferryfield to Le Touquet, Calais and Ostend, from Southampton to Cherbourg and Deauville, and from Belfast to Ronaldsway and Stranraer) and coach-air services from London to Paris (the coach-air service London-Lyon has been suspended).

In addition to taking over the cross-Channel services formerly operated by Air Kruise, Silver City has—by the formation of a Northern Division—absorbed Dragon Airways at Newcastle, Lancashire Aircraft Corporation at Blackpool and Manx Airlines at Ronaldsway. The Northern Division's scheduled network includes international routes from Newcastle to Düsseldorf, Hamburg, Brussels and Amsterdam, and from Blackpool to Ostend, and domestic routes linking Blackpool, Newcastle, Isle of Man, Edinburgh, Belfast, Birmingham, Leeds/Bradford, Glasgow, Carlisle and Jersey.

Head Office: 62 Brompton Road, London, S.W.3. *Executives:* Eoin C. Mekie, chairman; A.V-M. S. D. MacDonald, general manager, B.A.S.; W. G. Franklin, commercial director; M. D. Day, technical director. *Fleet:* seven Bristol 170 Mk. 31, 14 Bristol 170 Mk. 32, seven DC-3, one DC-2, three Solent, five Hermes, two Heron, three Rapide, one Consul.

Cambrian Airways, Ltd., has expanded its scheduled network since concluding a 10-year contract with B.E.A. in 1956, and now flies to the Channel Isles from Swansea, Cardiff, Liverpool and Bristol; and to Belfast, Manchester, Southampton and Paris from Cardiff and Bristol. In February 1958 B.E.A. acquired a 33⅓ per cent share in Cambrian.

Head Office: Rhoose Airport, Cardiff, Wales. *Executives:* J. H. Watt, chairman; W/C. L. B. Elwin and W. W. Stanley, joint managing directors; B. J. Callan, commercial and operations manager; G. A. Perrott, chief pilot; R. H. Boutcher, chief engineer. *Fleet:* two DC-3, three Heron. On order: one Heron.

Channel Airways (East Anglian Flying Services, Ltd.). Scheduled passenger services from Southend to Rotterdam, Channel Isles, Ostend and Le Touquet, with connections to Birmingham, Ipswich and Rochester.

Head Office: Southend Airport, Essex. *Executives:* S/L. R. J. Jones, managing director; A. E. Hugo Parsons, director operations. *Fleet:* five Dove, two Rapide.

Dan-Air Services, Ltd., carries out charter flights and inclusive-tours from Blackbushe (the technical base is at Lasham).

Head Office: 36-58 New Broad Street, London, E.C.2. *Executives:* F. E. Newman, J. W. Davies, E. O. Wallis (directors); A. F. Austin, secretary; L. E. Moore, general manager. *Fleet:* four York, two DC-3, one Bristol 170.

Derby Aviation, Ltd. A wide range of activities include scheduled services from Derby to Jersey, Isle of Man, Glasgow and Ostend, inclusive-tours, charter services, flying training, aerial survey, aircraft sales and maintenance.

Head Office: 78 Buckingham Gate, London, S.W.1. *Executives:* G/C. C. A. B. Wilcock, chairman; J. Harben-Grice, W/C. H. A. Roxburgh, E. W. Phillips, R. R. Paine, directors; A. C. Fleta, secretary. *Fleet:* three DC-3, three Marathon.

Don Everall Aviation, Ltd., operate scheduled services from the Midlands to the Isle of Man and to the Channel Isles, charter services and inclusive-routes from their main base at Wolverhampton.

Head Office: Elmdon Airport, Birmingham. *Executives:* D. Everall and C. Everall, directors; A. D. Atkinson, operations manager; E. Holden, chief engineer. *Fleet:* one DC-3, three Rapide, one Messenger, three Auster.

Dragon Airways—see British Aviation Services.

Eagle Airways, Ltd., has developed a rapidly-growing network of scheduled operations. Current services with Vikings are from London to Luxembourg, Innsbruck, Dinard, La Baule, Ostend and Jersey, and from Manchester to Ostend. Services operated by Viscounts are Manchester to Hamburg, Copenhagen, Brussels and Frankfurt, London to Pisa, and Birmingham to Majorca (the last two services also being operated by Vikings). An associated company, Eagle Aviation, conduct charter and trooping services, while a recently-formed subsidiary, Eagle Airways (Bermuda), Ltd., plans to inaugurate a daily New York-Bermuda service using Viscount 805s on May 1 this year.

Head Office: Marble Arch House, 40 Edgware Road, London, W.2. *Executives:* H. Bamberg, chairman/managing director; A. R. Bamberg, N. Ashton-Hill, G. W. Pitt, J. H. Sauvage, directors. *Fleet:* 17 Viking, two Viscount 805.

East Anglian Flying Services, Ltd.—see Channel Airways.

Fison-Airwork, Ltd., undertake long-term helicopter contracts and charter flights. Recent activities include oil exploration in Nigeria, pipe-line inspection in Pakistan, and numerous crop-spraying and insect-control operations.

Head Office: Bourne, Cambridge. *Executives:* M. Wyatt, chairman; J. E. Harper, L. A. Lafone, W. J. McEwen, W. E. Ripper, G. E. Wildman-Lushington, directors; A. G. Wormald, secretary. *Fleet:* eight Hiller, four Whirlwind.

Hunting-Clan Air Transport, Ltd.—scheduled operations include "Safari" services to West, East and Central Africa (using Viscounts, in conjunction with Airwork, Ltd.), a colonial-coach service to Gibraltar, and the "Africargo" freight service to East Africa. H.C.A. also perform frequent trooping, charter and inclusive-tour flights. An associated company, Hunting-Clan African Airways, flies freight services from Salisbury to Kariba, Lusaka and on to Nairobi, and inclusive-routes to Kariba and Mozambique. Field Aircraft Services, Ltd.,

Loading a Hampshire Down lamb into a Hunting-Clan DC-3 at Nairobi. (Below) Skyways Continental coach-air DC-3 service to Paris.

WORLD AIRLINE DIRECTORY...

another associate, conducts servicing. The Hunting Group also controls subsidiaries engaged in aircraft manufacture and in aerial survey.
Head Office: London Airport, Middlesex. *Executives:* M. H. Curtis, managing director; E. H. Baker, secretary; Capt. L. B. Greensted, technical director; D. J. Platt, commercial manager; J. Robinson, sales manager. *Fleet:* three Viscount, nine Viking, three York. On order: two Britannia 315, two DC-6A.

Independent Air Travel, Ltd., founded in 1956, is engaged only on charter services.
Head Office: Hurn Airport, Bournemouth. *Executives:* Capt. M. K. Kosubski, managing director; Capt. Lloyd, operations manager.
Fleet: seven Viking, two DC-4.

Jersey Airlines, Ltd., in which B.E.A. acquired a 25 per cent share in 1956, operates scheduled services linking the Channel Isles to London, Manchester, Southampton, Bournemouth and Exeter in the U.K., to Paris, St. Brieuc, Dinard, Nantes and Cherbourg in France and to Bilbao.
Head Office: 4 The Parade, St. Helier, Jersey. *Executives:* M. L. Thomas, chairman/managing director; B. W. Gardiner, T. C. Chandler, R. L. Weir, directors; J. S. Cunningham, secretary. *Fleet:* seven Heron, one Wayfarer, two Rapide.

Lancashire Aircraft Corporation, Ltd.—see British Aviation Services.

Manx Airlines—see British Aviation Services.

Morton Air Services, Ltd., fly scheduled services from Croydon to Rotterdam, Le Touquet and the Channel Isles, and also conduct charter and ambulance flights. Olley Air Services is a subsidiary company.
Head Office: Croydon Airport, Surrey. *Executives:* T. W. Morton, chairman/managing director; J. Fargher, secretary; Peter Eskell, commercial manager. *Fleet:* one Heron, eight Dove, three Rapide, two Consul.

Olley Air Services, Ltd., a subsidiary of Morton Air Services, Ltd., operates a scheduled service to the Channel Isles in co-operation with Morton.
Head Office: Croydon Airport, Surrey. *Executives:* T. W. Morton, chairman/managing director; J. Fargher, director; S. Carter, secretary and commercial manager. *Fleet:* see Morton Air Services.

Orion Airways, Ltd., operate charter services from Blackbushe.
Head Office: Blackbushe, Hants. *Executives:* P. E. Palmer, chairman and managing director; J. Hughes, commercial manager; H. Biddle, technical director. *Fleet:* one Viking.

Overseas Aviation (Channel Islands), Ltd., operate non-scheduled services, particularly on behalf of Continental operators. Aircraft are maintained by B.K.S. at Southend. The company is a subsidiary of Mr. R. Myhill's Overseas Aviation, Ltd., which conducts charter services, concentrating on sky-writing.
Head Office: 26 Hill Street, St. Helier, Jersey. *Executives:* R. Myhill, chairman; D. Ludby, P. de V. Stevens, directors; B. Dromgoole, managing director. *Fleet:* three Viking.

Scottish Airlines, Ltd., is engaged on charter services for passengers and freight and on a scheduled service between Prestwick and Ronaldsway.
Head Office: Prestwick Airport, Ayrshire. *Executives:* I. C. Grant, general manager; D. McConnell, secretary; W. A. Wilkinson, technical manager. *Fleet:* two York, one DC-3. On order: five Twin Pioneer.

Silver City Airways, Ltd.—See British Aviation Services.

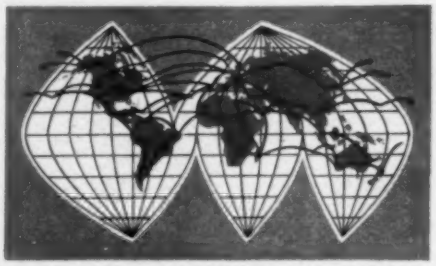
Skyways, Ltd.—scheduled services fall into three groups: the "Crusader" service from London to Cyprus via Malta; coach-air services from London to Paris, Nice, Vichy and Brussels; and the freight service for livestock from Stansted to Beauvais. Skyways' trooping services include frequent flights to Singapore in co-operation with Airwork, Ltd.
Head Office: 7, Berkeley Street, London, W.1. *Executives:* Sir Wavell Wakefield, chairman; Erick Rylands, managing dirctor; A. J. Henderson, secretary; J. M. Twiss, general manager administration; H. P. Snelling, general manager commercial; E. Barker, general manager financial. *Fleet:* 14 York, four DC-3.

Starways, Ltd. operate charter services and a scheduled service London - Liverpool.
Head Office: Speke Airport, Liverpool. *Executives:* P. H. Wilson, chairman; J. A. Wilson, director. *Fleet:* four DC-3, one DC-4.

Transair, Ltd., was last year awarded the first Viscount trooping contract, operating between the U.K. and the West Mediterranean. The company conduct intensive mail and freight services under long-term charter and also engage on inclusive-tours, on *ad hoc* charter flights and on a seasonal scheduled service, London to Jersey. Transair is controlled by Airwork, Ltd.
Head Office: Croydon Airport, to April 1958, subsequently at Gatwick Airport. *Executives:* G. H. Freeman, chairman/managing director; C. W. Bebb, operations manager; H. S. Perren, commercial manager. *Fleet:* 11 DC-3, two Viscount 804. On order: one Viscount 804.

The Overseas Carriers

A digest of the world's air transport operators, their routes, executives and fleets



Aaxico Airlines, Inc., took its present name on December 31, 1956, having previously worked as American Air Export and Import Company. The company is an all-cargo carrier flying scheduled services between New York and New Orleans, and between New Orleans and Detroit.
Head Office: Miami, Florida, U.S.A.
Executives: Howard J. Korth, president and general manager; E. P. Odenwalder, secretary/treasurer; J. G. Helvey, vice-president; Oliver F. Stern, vice-president cargo sales (New York).
Fleet: three C.46F.

Açoriana, see Sociedade Aeriana de Transportes Aereos, Ltda.

Aden Airways, Ltd., a wholly owned subsidiary of B.O.A.C., operate local services and international routes ranging from Cairo and Damascus in the north to Nairobi in the south. The company was incorporated on March 1, 1949, and became self-accounting under its own board of directors on October 1 of that year.
Head Office: Khormaksar, Aden.
Executives: S. Broad, general manager; L. Bennett, commercial manager; R. Haseldine, secretary/accountant.
Fleet: eight DC-3, one D.H.89.

Aer Lingus, Teoranta, began operations in 1936 with a D.H.84, which was used on the Dublin-Bristol route. The company now operates a fleet of Viscounts and DC-3s on routes linking Ireland with Britain, Holland, Belgium, France, Spain, Germany, Switzerland and Italy. Under an agreement signed in 1956, B.E.A. holds 10 per cent of the shares of Aer Lingus and co-operates with the company on certain routes between the United Kingdom and Ireland.
Head Office: Dublin, Republic of Ireland.
Executives: P. Lynch, chairman; J. F. Dempsey, general manager; Capt. J. C. Kelly-Rogers, deputy general manager; Capt. W. J. Scott, operations manager; O. Hone, traffic manager; J. Gorman, secretary.
Fleet: four Viscount 707, 13 DC-3, three Viscount 808. On order: seven Friendship (1958).

Aerlinte Eireann, Irish Air Lines, are due to begin operations between Ireland and the U.S. in April 1958 using chartered Super Constellations.

Aero Ypenburg is a Dutch company engaging in various aspects of civil aviation. Itself a subsidiary of Luchvaart Technische Handelnij Schreiner and Co., N.V., Aero Ypenburg has four subsidiaries concentrating on particular fields: Aero-Contractors (owned jointly with N.V.M. ter Behartiging van Vervaersbelangen —a consortium of de Deli Spoorweg, Gulderse Tramweg and Maarse and Kroon) will start regular helicopter services in Rotterdam this summer, and already conducts helicopter charter services; Aero-Coop (owned jointly with "Centraal Bureau") provides helicopter charter services in connection with land reclamation; Aero-Camera specialises in aerial photography; Aero-Cargodoors is an aircraft handling organisation.
Head Office: Rotterdam, Netherlands.
Executives: B. Schreiner, E. Schreiner.
Fleet: one Piper Apache, four Bell 47, one Djina. On order: four Kolibrie.

Aeroflot-Grazdanskij Wozdusnyj Flot is the Soviet airline, but it is not truly comparable with the airlines of the West, as in addition to operating passenger, freight and mail services, it is responsible for all aspects of civil aviation. Among its many activities are agricultural, survey and ambulance flying. In 1929 the pioneer Soviet airlines were amalgamated to form Dobrolet, which in 1932 was reorganized and became Aeroflot. The airline now operates an extensive route network within the U.S.S.R., to neighbouring Communist countries and to Pekin, Stockholm, Copenhagen, Helsinki. The Tu-104 is already in use to Copenhagen. Later in 1958 this aircraft is planned to start serving London and Delhi.
Head Office: Moscow, U.S.S.R.
Executives: Marshal P. F. Zhigarev, director general; Lt. Gen. N. A. Zakharov, deputy director general.
Fleet: Tu-104, Il-14, Il-12, Li-2, An-2, Po-2, Il-20, Yak 12R and other types.

Aero Libia is reported to be in the process of formation and will become Libya's national airline. Alitalia is probably associated with this new venture.
Head Office: Tripoli, Libya.
Fleet: on order, Convair 440, DC-3.

Aerolineas Argentinas-Empresa del Estado. was founded as a state corporation in May 1949 by the Ministry of Transport to take over the operations of FAMA, ALFA, Aeroposta and ZONDA. The airline maintains a domestic network and international services to neighbouring South American countries, Cuba, the U.S.A. and Europe.

Versatile load carrier . . .

Dart Heralds are the local-service transports which carry 43 passengers, nearly 5 tons of cargo or combinations of both—in a ratio which can be varied by movable partitions to suit traffic on each stage of a route. A low and level cabin floor enables bulky freight to be loaded simply.

Easy maintenance and operational economy are features of the pressurised Dart Herald. Cruising at 275 m.p.h., its range with full tanks and a 6,200 lb. payload is more than 1,400 miles.

Efficient and comfortable, powered by renowned Rolls-Royce turboprop engines, it will bring new operational standards to short- and medium-haul air routes.

DART *Herald*

Engines: Two Rolls-Royce Dart turboprops

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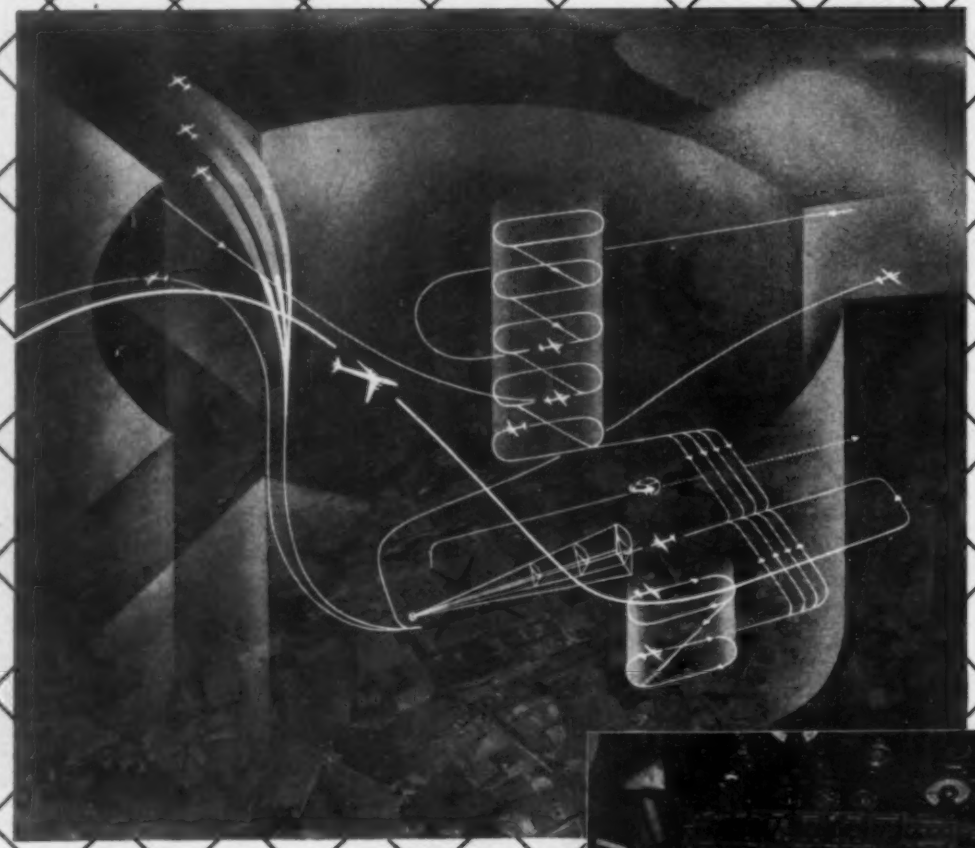

Decca in the *Jet Age*

As more high-performance turbo-prop and turbo-jet aircraft come into service, so the problems of Air Traffic Control become more acute. For these aircraft, precise navigation is more than ever the paramount need if they are to climb and descend safely through varying levels of medium and low altitude aircraft.

The accuracy and flexibility of the Decca Navigator, which continuously pin-points the pilots exact position, ensures the efficient working of any traffic pattern, however complex. Holding areas can be designated and flown precisely at any altitude however high. No other aid can do this. Furthermore, no re-positioning of ground facilities is required if airways, terminal area procedures or holding patterns have to be changed for any reason.

The Decca Navigator can do much to reduce separation standards, so essential to economical use of air space. Indeed, it is the inherent precision and reliability of the Decca System that adds to the safety of high-performance aircraft, both in terminal areas and en route.

All BEA Viscounts are fitted with the Decca Navigator. Invaluable information on the requirements of jet age air traffic has been gained from over four years' operation in these aircraft.

THE DECCA NAVIGATOR

THE WORLD'S MOST ACCURATE NAVIGATION SYSTEM

THE DECCA NAVIGATOR COMPANY LIMITED LONDON

WORLD AIRLINE DIRECTORY...

Head Office: Buenos Aires, Argentina.
Executives: A. E. Llavallol, chairman; Vice Comodoro A. Becher, vice-chairman; J. Carlos Mason Lugones, general manager; D. P. Albano, operations manager; G. A. Zalazar, economic planning manager.
Fleet: six DC-6, seven DC-4, four Convair 240, 16 DC-3, seven Sandringham.

Aerolineas Mexicanas S.A., is operating domestic services linking Mexico City with Zihuatanejo, Acapulco, Leon, San Luis Potosi, Saltillo, Monclova and Piedras Negras.
Head Office: Mexico City, Mexico.
Executives: R. Alcantara, president; R. Torres, operations manager.
Fleet: two DC-3. On order: two DC-3.

Aerolineas Peruanas operates Curtiss Commandos from Tegucigalpa to Santiago in co-ordination with T.A.N. (Honduras) and Aerolineas Argentinas, thus allowing a through service between Miami and Buenos Aires.
Head Office: Lima, Peru.

Aéromaritime—see Union Aéromaritime de Transport.

Aeronaves de Mexico, S.A., was founded on September 1, 1934, and began operating between Mexico City and Acapulco. Its early fleet consisted of a three-engined Stinson, three Bellanca Pacemakers and a Fairchild 24. The airline now has a route network of about 6,500 miles within Mexico. In 1952 Aeronaves bought LAMSA (founded in 1934) from United Air Lines and in 1954 the company also acquired Aerovias Reforma, which had been founded in 1945. In 1956 Aeronaves placed Britannias into service between Mexico City and New York.
Head Office: Mexico City, Mexico.
Executives: A. D. Lombardo, president; C. Ramos, general manager; R. L. Johnson, operations manager; M. Munoz, traffic and sales manager.
Fleet: 15 DC-3, three DC-4, four Convair 340, three Britannia 302, three L.749.

Aero-Nord Sweden A.B., operates scheduled newspaper and limited passenger services within Sweden.
Head Office: Stockholm, Sweden.
Executives: P. S. Holmström, managing director.
Fleet: one Aero Commander, one Oxford, two Piper Cub.

Aeronorte—Empresa de Transportes Aereos Norte do Brasil, S.A., began operations in 1950 and operates a network of feeder services in the north-east of the country. Percival Prince aircraft were used originally but the present schedules are worked by DC-3s. In 1953 Real acquired control of the company but Aeronorte works as a separate division. By early 1955 the Aeronorte route mileage exceeded 4,000 miles.
Head Office: Sao Luiz, Brazil.
Executives: Commandante L. Gomes, president; N. Freire, general manager.
Fleet: four DC-3.

Aaxico's all-cargo operations are performed by a fleet of three C-46Fs.

Aero O/Y—Finnair was founded in 1923 and began operations, with single-engined Junkers-F13 floatplanes, in 1924. Landplane operations began in 1936 when airports became available. After the war Aero O/Y developed its European routes which culminated in the opening of a service to London-in 1954.
Head Office: Helsinki, Finland.
Executives: L. Grandell, president; B. Aulin, vice-president technical; A. Nyström, vice-president commercial.
Fleet: three Convair CV-440, three Convair CV-340, 10 DC-3.

Aerotaxi—see Aérovias Nacioñales de Colombia.

Aerotechnique operates non-scheduled services from Algeria.
Fleet: five DC-3, two Consul, three Beech, one Rapide.

Aerotransportes Litoral Argentina is reported to be in the process of formation. It has been granted a 15-year licence to operate from Rosario to Buenos Aires, Resistancia, Tucuman, Mendoza, Bahin Blanca and Mar del Plata.

Aero Transportes, S.A.—ATSA. Founded in 1943 and began scheduled services in 1944. Services were suspended in the following year and resumed in January 1947. The company now operates a return service on weekdays between Monterrey and Brownsville/Matamoros, using aircraft chartered from Cia Mexicana.
Head Office: Mexico City, Mexico.
Executives: R. O'Farrill, president; H. J. Filsinger, general manager; J. P. Centella, sales manager.
Fleet: one DC-4.

Aerovias Brasil, S.A.—see REAL S.A. Transportes Aereos.

Aerovias Ecuatorianas C.A. (AREA), was founded in 1949 and began operations in 1951. AREA took over the routes formerly worked by Aero Transporte Ecuatoriano and Transandia Ecuatoriana. The company is believed to be operating an internal route network but no recent news is available.
Head Office: Quito, Ecuador.
Executives: L. Arias, president; A. Arias, general manager.
Fleet: two Boeing Stratoliner, four DC-3, five Anson, three Navion. On order: one Friendship.

Aérovias Nacioñales de Colombia—AVIANCA claims to be the oldest airline in the Americas—and, in fact, it was formed (in 1940) as the result of a merger of S.C.A.D.T.A. (founded in 1919) and Servicio Aereo Colombiano. S.C.A.D.T.A. was founded by German interests but in 1931 Pan American Airways acquired an 80 per cent interest—which was, however, reduced to 64 per cent at the time of the merger. The company operates domestic services and services to Venezuela, Ecuador, Jamaica, the U.S.A., Bermuda, Portugal, Spain, France and Germany. In 1951 Avianca acquired the second largest Colombian airline LANSA and in 1952 also took over SAETA. A wholly owned subsidiary, Aerotaxi Ltd., operates Cessna 195 and Beaver aircraft to areas which cannot be served by larger aircraft. Another subsidiary, Companies Helicopteros Nacioñales de Colombia (Helicol) is jointly owned with Keystone Helicopter Corp. (U.S.).
Head Office: Bogotá, Colombia.
Executives: J. G. Restrepo Jaramillo, president; S. P. Martinez, executive vice-president; J. B. Alarcon, secretary general.
Fleet: four L-1049G, one L-749A, 12 DC-4, 20 Hi-per DC-3, 11 C-47, 11 Beaver, nine Cessna.

Aerovias Panama Airways was founded in 1951 as Aerovias Interamericanas de Panama, S.A. (Avispa), and began operations mainly as a cargo carrier using C-46s leased from the Colombian company Lineas Interamericanas. In 1952 the company was designated by the Panama Government to operate a Panama-Miami route. In 1954 the airline concluded an agreement with Trans-Caribbean Airways whereby a DC-6 and flight crews would be supplied for the Miami service. Services are now operated between Panama and Miami and between Panama and Lima via Guayaquil.
Head Office: New York, U.S.A.
Executives: H. Barletta, president; C. R. Howell, secretary/treasurer.
Fleet: one DC-4, C-46.

Aerovias "Q." S.A.—"Q" Airways, was founded in October 1945 and began operations in 1946 to Key West and Gerona. Present operations are from Havana to West Palm Beach, Florida, twice a week; to Gerona, Isle of Pines, twice daily; and to Key West, Florida, thrice daily.
Head Office: Havana, Cuba.
Executives: M. Quevedo, president/general manager; M. Rodriquez, traffic manager; J. E. A. de Regato, operations manager.
Fleet: four C-46, two DC-4.

Aerovias Sud Americana, Inc., was founded in 1949 as a contract cargo carrier operating a route from Tampa, Florida, to Havana. Scheduled services were begun in December 1952 with routes extending as far south as Bogotá in Colombia. Countries now served are Cuba, British Honduras, Guatemala, Salvador, Nicaragua, Costa Rica, Panama, Colombia and Ecuador.
Head Office: St. Petersburg, Florida, U.S.A.
Executives: V. V. Carmichael Jnr., president and general manager; M. K. Williams, director operations; C. Booker Powell, vice-president; W. M. Bussey, secretary; J. M. Rodriguez, treasurer; R. C. Minor, vice-president maintenance.
Fleet: four Curtiss C-46.

An Aer Lingus Viscount 808 in front of the terminal building at Dublin Airport.

Air Liban last year acquired this DC-6C by arrangement with Sabena.

WORLD AIRLINE DIRECTORY...

Aerovias Venezolanas, S.A.—AVENSA., operates domestic passenger and freight services with DC-3s and Convairs; two Convair services a week between Venezuela and Miami via Jamaica; and a weekly C-46 operated cargo service from Caracas to Miami, returning via Kingston. The company was formed in 1943 by Venezuelan interests and Pan American Airways. Regular services were begun in 1944.
Head Office: Caracas, Venezuela.
Executives: H. L. Boulton, president; A. Boulton, acting president/general manager; G. O. Tucker, vice-president operations; R. van der Branden, vice-president traffic and sales; J. Sáiz, chief accountant.
Fleet: five Convair 340, two Convair 440, 18 DC-3, three C-40. On order: five F-27.

Aigle Azur Extreme-Orient (was Aigle Azur Indochina) now operates only non-scheduled services from Saigon.
Fleet: five Stratoliners, five DC-3, two Bristol 170, one C-46, two Beaver, three Otter.

Air Algérie—see Compagnie Générale de Transports Aériens Air Algérie.

Air Atlas-Air Maroc, see Royal Air Maroc.

Air Ceylon, Ltd., founded by the Ceylon Government in 1947, in that year opened services between Ceylon and India. In 1949 a route to London was opened. In 1951 Air Ceylon was made an independent company with the Government holding 51 per cent of the stock and Australian National Airways holding 49 per cent. A route to Australia was opened, thus providing a through Australia - Ceylon - London service; this route was abandoned in 1953 but in co-operation with K.L.M. the route to Europe (serving London and Amsterdam) was reopened in 1956 using a K.L.M. Constellation painted in Air Ceylon colours but with Dutch registration.
Head Office: Colombo, Ceylon.
Executives: L. M. Fernando, managing director; K. de Croos, traffic manager; F. B. W. Goonewardena, accountant; W. A. E. Molamure, chief engineer; G. E. Ferdinand, chief pilot.
Fleet: two DC-3, one L-749 (chartered from K.L.M.).

Air France—see Compagnie Nationale AIR FRANCE.

Air-India International was formed as a limited company in June 1948 with Air-India Ltd. holding 51 per cent of the shares and the Government of India 49 per cent. On August 1, 1953, A.I.I. became a State-owned corporation with the continuing responsibility of operating Indian long-distance international air services.

The company began operations of a weekly Bombay - Cairo - Geneva - London service in June 1948. A.I.I. now operates daily services between India and England. Rome, Paris, Zürich, Düsseldorf, Prague, Beirut and Damascus have been added as calls on this route while Delhi and Calcutta have been added as Indian terminals. The airline also operates services to Bangkok, Hong Kong, Tokyo, Madras, Singapore, Sydney, Karachi, Aden and Nairobi.
Head Office: Bombay, India.
Executives: J. R. D. Tata, chairman; B. R. Patel, general manager; S. K. Kooka, traffic manager; A. C. Gazdar, technical director; N. J. Pavri, controller of accounts.
Fleet: five L.1049E, three L.1049G, one DC-3, On order: three Boeing 707-420 (1960), two L.1049G.

Air Ivoire was established by T.A.I. in 1956 and operates services in French West Africa with Rapides to connect up with TAI's main services.
Head Office: Abidjan, French West Africa.

Air Jordan Co., Ltd., was founded in 1950 by local interests and services were begun with Airspeed Consuls. In 1953 Transocean Air Lines acquired an interest in Air Jordan and DC-3s were introduced. The airline now operates from Jerusalem and Amman to Cairo, Damascus, Beirut, Kuwait, Benghazi, and Tripoli (Libya).
Head Office: Amman, Jordan.
Executives: A. Z. Nuseibeh, chairman; R. M. Stanley, general manager.
Fleet: three DC-3, one C-46, one Rapide.

Air Laos was formed in 1952 by Air France, Aigle Azur and local interests. Air France subscribed 30 per cent of the original stock and Aigle Azur 20 per cent. Services are operated from Vientiane to a number of places in Laos and to Saigon, Bangkok and Hong Kong.
Head Office: Vientiane, Indo-China.
Fleet: six DC-3, two Bristol 170, two Stratoliner, two Otter, one Beaver.

Air Liban was founded in 1945 as Compagnie Générale de Transport and took its present title in 1951. Air Liban is an associate of Air France and operates services between Beirut and Accra, Aleppo, Cairo, Dahran, Doha, Fort Lamy, Jerusalem, Jeddah, Khartoum, Kuwait, Lagos and Nicosia.
Head Office: Beirut, Lebanon.
Executives: A. Schnaoui, president; H. Naccache, director general; J. Serrant, commercial director.
Fleet: three DC-3, two DC-4, one Languedoc, two DC-6. On order: one DC-6.

Air Madagascar was founded in 1947 and operates a network of services within Madagascar. The company is a subsidiary of T.A.I.
Head Office: Tananarive, Madagascar.
Executives: M. Vernier, director general; M. Callu, asst. director; M. Meyer, chief pilot; M. Lossignol, chief of technical services.
Fleet: three DC-3, five D.H.89, one Cessna. On order: five Broussard.

Airtaco—see Linjeflyg.

Air Vietnam was founded in 1951 to take over domestic and regional services previously operated by Air France. The Vietnamese Government holds 50 per cent of the stock and Air France holds 33 per cent. Air Vietnam flies domestic services and to Laos, Hong Kong and Bangkok.
Head Office: Saigon, Indo-China.
Executives: N. Van Khai, president; M. Bruyant, vice-president.
Fleet: six DC-3, four Bristol 170, two DC-4.

A.L.A.—Sociedad de Transportes Aereos, Ltda., operates scheduled services between Santiago and Africa and between Santiago and Havana, Cuba, via Lima, Guayaquil and Panama. The possibility of a merger with Cinta is being discussed.
Head Office: Santiago, Chile.
Executives: E. Sepulvedo, general manager; A. Elliot, chief operations.
Fleet: one C-46, one DC-4.

Alaska Airlines, Inc., adopted its present title in 1944, having been founded in 1937 as Star Air Lines Inc., to take over Star Air Service, which had been doing charter work for several years; the latter had acquired McGee Airways, which was founded in 1932. In 1942 and 1943 Star Air Lines took over Pollack Air Lines, Lavery Airways and Mirow Air Service. Alaska Airlines, which has an extensive Alaskan route system and also serves Seattle and Portland, still uses the title "Route of the Starliners."
Head Office: Seattle, Washington, U.S.A.
Executives: Charles F. Willis, Jnr., president; Homer W. Robinson, chairman; R. J. Norris, treasurer.
Fleet: two DC-4 owned, one leased, one DC-3, three C-46, six Norseman, four Cessna 180. On order: three DC-6A.

Alaska Coastal Airlines operate a network of domestic services based on Juneau. The airline was formed in 1939 as a partnership by Alaska Air Transport, founded in 1935, and Marine Airways, founded in the following year.
Head Office: Juneau, Alaska.
Executives: S. B. Simmons and O. F. Benecke,

Aérovias Nacionales de Colombia's Lockheed Constellation L.749A.

Air India's Super Constellations operate through Cairo on their Bombay to London daily service.

co-managers; F. L. Guertin, traffic manager; H. S. Gruening, operations manager.
Fleet: nine Goose, one Canso, one Bellanca Pacemaker, one Lockheed Vega, one Cessna 195, two Piper Pacer, one Hiller 12C, one Cessna 180.

Alitalia—Lineas Aèreas Italiane was formed in 1946 as a joint British-Italian venture with B.E.A. holding 30 per cent of the original

An Allegheny Airline's Martin 2-0-2, operated under the fleet title "The Pennsylvanian."

capital. Additional capital was called up in 1955 and B.E.A. sold one-third of its investment to B.O.A.C. In autumn 1957 Alitalia was merged with L.A.I. (see separate entry), its capital being increased from L.4,500 million to L.10,000 million. Alitalia operates a European network and routes to South, North and East Africa, Brazil, Argentina, Venezuela, the U.S. and to the Middle East.
Head Office: Rome, Italy.
Executives: Count Dr. N. Carandini, president; Gen. Urbani, vice-president; Ing B. Velani, general manager; Dr. D. Saracino, asst. general manager; R. Cappelletti, commercial director; Ing Rimer, technical director.
Fleet: 12 DC-3, four Convair 340, two Convair 440, three DC-6, eight DC-6B, six DC-7C, 10 Viscount 785 (being delivered). On order: four DC-8.

All Nippon Airways was recently established through the merger of Far Eastern Airlines (a subsidiary of C. Itoh) and Japan Helicopter. The company operates feeder services from Osaka, Tokyo and Fukuoka.
Fleet: two Marathon, four Dove, nine DC-3, six Bell 47, one Piper, one Otter, and three Heron chartered from Japan Air Lines.

Allegheny Airlines, Inc., was founded in 1937 as All-American Airways. That company pioneered "pick up" air mail services using Stinson Reliants with collection attachments. These services were worked under contract with the post office and from 1940 under C.A.B. certification. By 1946 nearly 6,000 miles a day were being flown at 94 per cent regularity. The system extended from Philadelphia in the east to Cincinnati in the west and Charleston in the south to Jamestown, N.Y., in the north. There were four flights a day. The service was withdrawn in 1949 after nearly 15 million miles had been flown. All-American began normal scheduled passenger services in 1949, and became Allegheny Airlines in 1953. Permanently certificated routes now extend from Detroit and Buffalo through Pennsylvania, New York, New Jersey, Maryland, Ohio, Delaware and West Virginia.
Head Office: Washington, D.C., U.S.A.
Executives: L. O. Barnes president; R. M. Love, chairman; E. K. Arnold, vice-president/secretary; D. L. Miller, vice-president traffic and sales; W. J. Short, vice-president/treasurer.
Fleet: 12 DC-3 owned, three DC-3 leased, seven Martin 2-0-2. Reported to be about to buy 11 Martin 2-0-2 from T.W.A.

Aloha Airline—see Trans-Pacific Airlines, Ltd.

American Airlines, Inc., which carries more passenger traffic than any other airline, was founded in 1934 as successor to American Airways which had come into existence in 1930 to integrate the operations of more than a dozen operators. The present-day organization is a vast undertaking and in 1957 its fleet of 206 aircraft flew five million passenger miles and 114 million freight and mail ton miles. The airline has over 60 aircraft on order at the present time. Its route system stretches from coast to coast, into Canada and south to Mexico, while throughplane agreements stretch the network southeast from Dallas to Miami.
Head Office: New York, U.S.A.
Executives: C. R. Smith, president; W. J. Hogan, snr. vice-president finance; C. W. Jacob, snr. vice-president/secretary; O. M. Mosier, snr. vice-president operations; C. R. Speers, snr. vice-president sales.
Fleet: 58 DC-7, 25 DC-6B, 50 DC-6, 63 Convair 240, 10 DC-6A, two DC-4. On order: 35 Electra (1959), 30 Boeing 707 (1959).

Ansett—A.N.A. was founded as Ansett Airways Pty., Ltd., by R. M. Ansett in 1936 and the airline's first service was opened that year between Melbourne and Hamilton, the route over which Ansett had previously operated road services. In 1952 Ansett took over the flying-boat operator Barrier Reef Airways and in 1953 acquired some of the routes of another flying-boat operator Trans Oceanic Airways. In 1957 Ansett acquired A.N.A. to become Australia's largest privately-owned airline. The merger between these two airlines is still in process. In addition to extensive land-plane services, sea-plane services are still operated by Sandringhams between Sydney and Hobart, from Sydney to Lord Howe Island; and (in summer) from both Sydney and Brisbane to Hayman Island.
Head Office: Melbourne, Victoria, Australia.
Executives: R. M. Ansett, chairman.
Fleet: (including that of A.N.A.) 20 DC-3, two Convair 340, four Convair 440, four DC-6B, two DC-6, eight DC-4, three Bristol 170, two Sandringham, one Bristol Sycamore, one Djinn.

A.P.A.—see Aerovias Panama, S.A.

Arab Airways (Jerusalem), Ltd., successor to Arab Airways Association, was founded in 1953, and B.O.A.C. has a minority interest. Services are operated within Jordan and to Iraq, the Lebanon, Egypt, Saudi Arabia, Kuwait, Aden and Syria.
Head Office: Amman, Jordan.
Executives: M. A. Bdeir, chairman; Sir Duncan Cumming, S. As'ad, M. Madi, Capt. J. Alger, A. Alauddin, board members; W. Salameh, manager; H. H. Pusey, resident adviser.
Fleet: three DC-3.

Arctic Wings, Ltd.—see Transair, Ltd. (Canada).

Ariana Airlines—see Aryana Airlines.

Arkia, Israel Inland Airlines, Ltd. Founded in 1950 by El Al and Kanfot, a company owned by the General Federation of Labour. At present the only scheduled operations are from Haifa to Tel Aviv/Yafo and from Haifa and

Piper Cubs being loaded into an Aerovias Sud Americana Commando.

WORLD AIRLINE DIRECTORY...

Tel Aviv to Elath at the head of the Gulf of Aqaba.
Head Office: Tel Aviv, Israel.
Executives: J. Hozman, managing director; L. Bigon, technical manager.
Fleet: four DC-3. On order: two Beech 18s.

Aryana Airlines Co., Ltd., was founded in 1955 with the assistance of Indamer Co., Ltd.; Afghanistan Government has a 51 per cent interest. Previously Indamer had held an Afghanistan Government contract for the carriage of pilgrims to Jeddah. The Indian company will be responsible for technical and operational matters and for training Afghan staff. Services are operated within Afghanistan and to Bahrain, Iran, Beirut and India.
Head Office: Kabul, Afghanistan.
Executives: Faiz Mahomed, president; R. Forhan, vice-president.
Fleet: two DC-4, three DC-3.

Asiatic Aeronautical Co., Ltd.—see Civil Air Transport.

Assam Air Transport—see Kalinga Airways.

Associated Airways, Ltd.—see Pacific Western Airlines, Ltd.

Associated Helicopters, Ltd.—see Pacific Western Airlines, Ltd.

ATSA—see Aero Transportes, S.A.

Australian National Airways Pty., Ltd., became a wholly owned subsidiary of Ansett Airways in 1957 and is now being merged into that airline. A.N.A. was incorporated in 1936 but can trace its origin to 1932, when Holyman Brothers Pty. opened services in Tasmania with a Fox Moth. A.N.A. and its predecessor were the first to operate DC-2s in Australia. The company took an interest in Cathay Pacific Airways in 1948 and also entered into partnership with Air Ceylon as a result of which A.N.A. was flying DC-4s between Australia and the United Kingdom via Ceylon. The airline operates an extensive network in Australia serving all the main cities, many more isolated areas, and also Tasmania. In 1948 A.N.A. was concerned with others in the formation of Air Beef Pty., Ltd., which has been carrying heavy loads of carcases from the Kimberley district to Wyndham on the northwest coast.
Head Office: Melbourne, Victoria, Australia.
Fleet: see Ansett-A.N.A.

Austrian Airlines — see Osterreichische Luftverkehrs A.G.

AVISPA—see Aerovias Panama, S.A.

Avalon Air Transport, Inc., operates flying-boat amphibian services between Long Beach Municipal Airport and Avalon on Catalina Island. In winter there are two flights a day and in season the route is served every half hour. In summer regular flights are also operated between Burbank, Santa Monica and Avalon.
Head Office: Long Beach, California, U.S.A.
Executives: Wilton R. Probert, president; W. B. von Kleinsmid, secretary/treasurer.
Fleet: six Grumman Goose.

AVENSA—see Aerovias Venezolanas, S.A.

Aviacion y Comercio, S.A. (AVIACO), was founded as a private non-scheduled operator in 1940, scheduled operations began in 1950. Routes radiate from Madrid to points on the Spanish mainland and from Madrid and Barcelona to Majorca. In North Africa, Tetuan, Casablanca, Oran and Algiers are served; there are also services from Spain and Casablanca to Las Palmas and Tenerife. A.Y.C. also operates a Marseilles - Majorca service. The company has also operated services from Spain to Brussels and Amsterdam and to West Africa and Spanish Guinea, but these have been discontinued.
Head Office: Madrid, Spain.
Executives: J. P. Montes, managing director; R. O'Connor, operations manager; F. MacLennan, commercial manager; J. Nedal, chief engineer; J. Inchaustl, traffic director.
Fleet: four Bristol 170, eight Languedoc, six Heron 2.

Aviameer Airlines, Ltd., was founded in October 1957 and plans to operate charter services.
Head Office: Antwerp, Belgium.
Executives: A. Meerbergen, director; P. Hagelhof, commercial manager.
Fleet: one Viking. On order: one Viking.

AVIANCA—see Aérovias Nacionales de Colombia.

AVIATECA—see Empresa Guatemalteca de Aviacion.

AYC—see Aviacion y Comercio.

Bahamas Airways, Ltd., was founded in 1936 to take over the operation of inter-island charter services begun in 1933. In 1943, Pan American Airways acquired a 45 per cent interest in the company but in 1949 Bahamas Airways was taken over by B.S.A.A. and the airline is now a wholly owned B.O.A.C. subsidiary. In March 1956, Bahamas Airways inaugurated a service to Grand Turk, Turks Island via San Salvador, Mayaguana and Great Inagua. The airline operates frequent services under a B.O.A.C. permit between Miami, Cat Cay, Bimini, West End, and Grand Bahama.
Head Office: Nassau, Bahamas, B.W.I.
Executives: H. G. Christie, chairman; B. G. W. Wiggett, deputy chairman; Capt. Peter Fair, general manager; K. Ashworth, secretary/accountant.
Fleet: three Heron, two Goose, one Canso.

Bahamas Helicopters, Inc., is one of the world's leading operators of helicopters. This company is nominally based at Nassau (it has no connection with Bahamas Airways, Ltd., being owned by American interests) and is associated with Armstrong-Flint Helicopters, Inc., Agricultural Helicopters, Inc., and World-Wide Helicopters, Inc.

Balair is a charter company that commenced operations in 1957.
Head Office: Basle, Switzerland.
Fleet: one Viking.

B.G.A.—see British Guiana Airways.

B.N.P. Airways, Ltd., is a small charter operator based in Vancouver.
Head Office: Vancouver, B.C., Canada.
Executive: T. Ingledow, president.
Fleet: three Grumman Goose.

Bonanza Airlines, Inc., was founded in 1945 and began service between Las Vegas and Reno in 1946. With 10 years of experience the company is now operating about 1,200 miles of routes in Nevada, Arizona and southern California.
Head Office: Las Vegas, Nevada, U.S.A.
Executives: E. Converse, president; Florence Murphy, vice-president/secretary; R. H. Herrnstein, treasurer; G. R. Henry, executive vice-president/general counsel; M. W. Reynolds, vice-president operations; Wm. J. Mitchell, vice-president traffic and sales.
Fleet: nine DC-3. On order: six Friendship (1958).

Braathens South-American and Far East Airtransport A/S. (S.A.F.E.) was formed in 1946 by the Norwegian Braathen shipping concern for the operation of long-distance charter services. Following non-scheduled flights to the Far East the company operated regular scheduled services between Norway and Hong Kong from 1949 until early in 1954, when the licence was not renewed by the Norwegian Government. The company now operates scheduled internal services with Herons from Oslo to Trondheim and in the area between Oslo and Kristiansand and Stavanger. S.A.F.E. also collaborates with Loftleidir in the operation of its Europe - Iceland - North America services. With the liquidation of Vestlandske Airways in spring 1958 the routes flown by this company were taken over by Braathens.
Head Office: Oslo, Norway.
Executives: L. G. Braathen, president; B. G. Braathen, vice-president; E. Fröysaa, commercial manager; J. Rad, operations manager.
Fleet: two DC-4, two DC-3, two Heron. On order: three Fokker Friendship (1958/59).

Braniff International Airways, Inc. The original Braniff company was founded in 1928 by Paul and Tom Braniff; and the line's first aeroplane, a Stinson Detroiter, bore the title Tulsa-Oklahoma City Airline on its fuselage. In 1929 the airline became part of the Universal Aviation Corporation and in 1930 Braniff Airways was organized as an independent company. The word International was added to the title in 1948, when services were begun to Havana and Lima. The airline now operates more than 15,000 miles of routes in the United States and to South America. The South American routes are via the west coast to Lima, from where they branch to Sao Paulo and Rio de Janeiro, La Paz, Asunción and Buenos Aires. In 1952 Mid-Continent Airlines was merged with Braniff.
Head Office: Dallas, Texas, U.S.A.
Executives: C. E. Beard, president; F. Jones, chairman; J. W. Miller, executive vice-president; R. V. Carleton, vice-president operations; O. W. Crane, treasurer.
Fleet: nine DC-6, 25 Convair 340; 23 DC-3, seven DC-7C, six Convair 440, two C-46, two L.049. On order: nine Lockheed Electra, five Boeing 707.

British Colonial Airlines—see British Honduras Airways.

British European Airways Corporation—see page 525.

British Guiana Airways, Ltd. In 1934 A. J. Williams, a U.S. citizen, began charter operations in British Guiana with a single-engined Ireland flying-boat. British Guiana Airways was founded by Mr. Williams to operate regular subsidized services in 1939. The company now flies numerous domestic services and also operates flying-boat services from British Guiana to Trinidad, Grenada, St. Lucia, Barbados, St. Vincent, Martinique and Dominica.
Head Office: Georgetown, British Guiana.
Executives: Lt-Col. A. J. Williams, O.B.E., managing director; H. E. Wendt, general manager.
Fleet: three DC-3, two Goose.

British Honduras Airways, Ltd., bought the assets of the Airline Division of British Colonial Airlines on October 24th, 1956, and is operating the services worked by the earlier company which was incorporated in March 1952. Scheduled services are operated between Corozal and Punta Gorda via Belize and Stann Creek. There are eight intermediate flag stops. Non-scheduled operations serve a score of other places in the territory.
Head Office: Belize, British Honduras.
Executive: Col. T. S. Baker, manager.
Fleet: two Cessna 180, two Cessna 170.

Orly after dark: Constellation L.1649As of Air France.

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The first all-electric Autopilot in the world to dispense entirely with vacuum tubes, the S.E.P.2 requires a minimum of maintenance. Servicing experience has proved that all the major units will operate 3,000 hours between routine overhauls with the fixed components operating for 6,000 flying hours. With three rate gyros for complete stability in flight and designed throughout for robust, reliable service, the S.E.P.2 gives greater efficiency in the air, as well as a better record in the log-book. *Smiths S.E.P.2 Automatic Pilot is fully approved by the American Civil Aeronautics Administration.*

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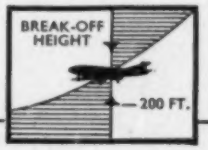

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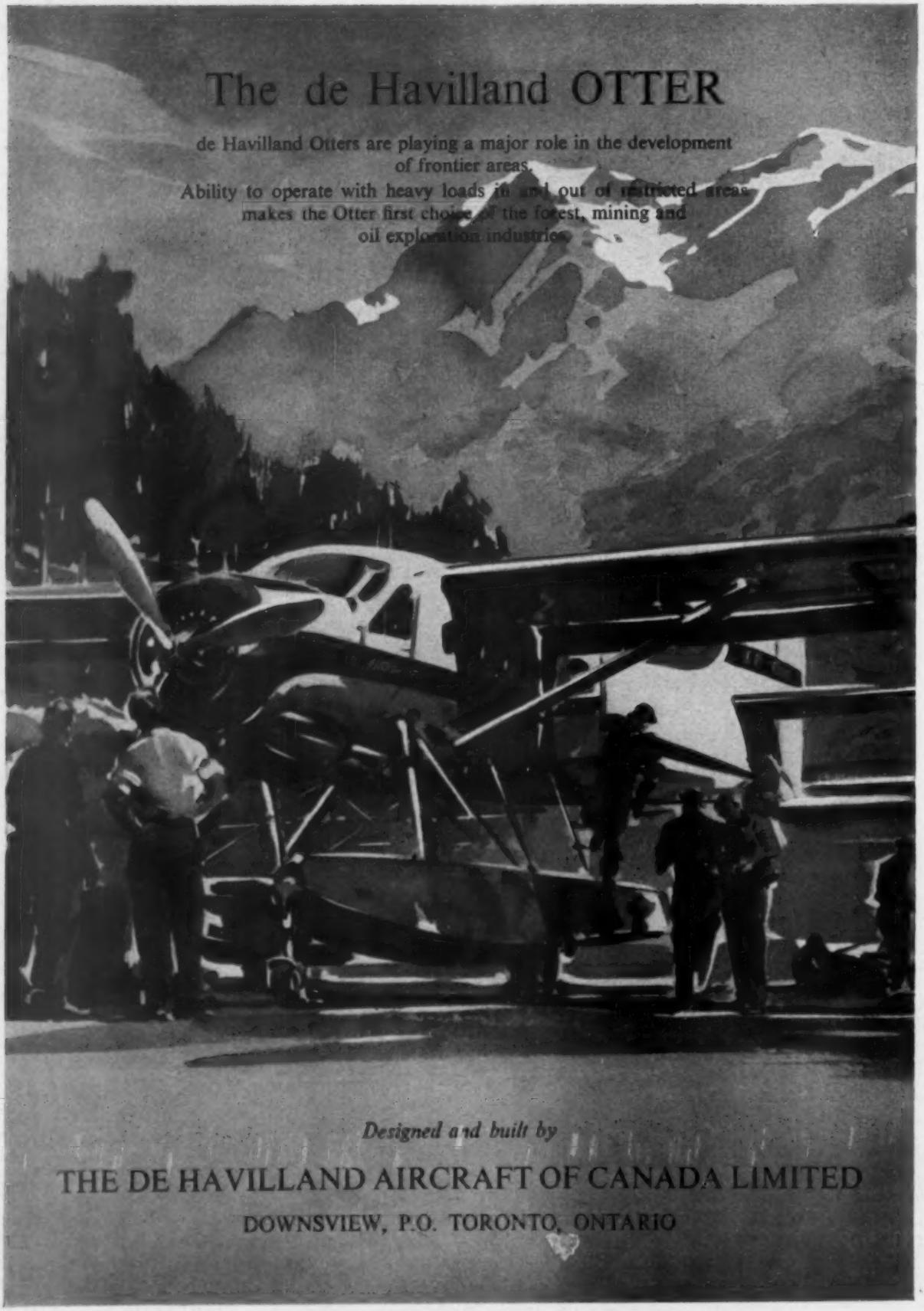
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WORLD AIRLINE DIRECTORY...

British Overseas Airways Corporation—see page 525.

British West Indian Airways, Ltd., is a wholly owned subsidiary of B.O.A.C. The original concern was organized in 1940 and began operations with one Lodestar. In 1947 British South American Airways acquired control of B.W.I.A. and this passed to B.O.A.C. when it took over B.S.A.A. In 1949 B.O.A.C. took over British Caribbean Airways and merged its operations with those of B.W.I.A. A considerable network of Caribbean services is operated and Viscounts have now been introduced on the following routes:—Trinidad - Barbados - San Juan - Bermuda - New York; Bermuda - New York; Nassau - Miami; Kingston - Montego Bay - Grand Cayman - Miami; Kingston - Caracas - Trinidad; and Trinidad - Barbados - San Juan.
Head Office: Port of Spain, Trinidad.
Executives: Sir Erol Dos Santas, chairman; J. H. Rahr, general manager; J. O. Johnson, traffic manager; F. W. Farfan, operations manager; M. J. Martinez, secretary.
Fleet: six Viscount; three DC-3; one Viking. On order: two Viscount.

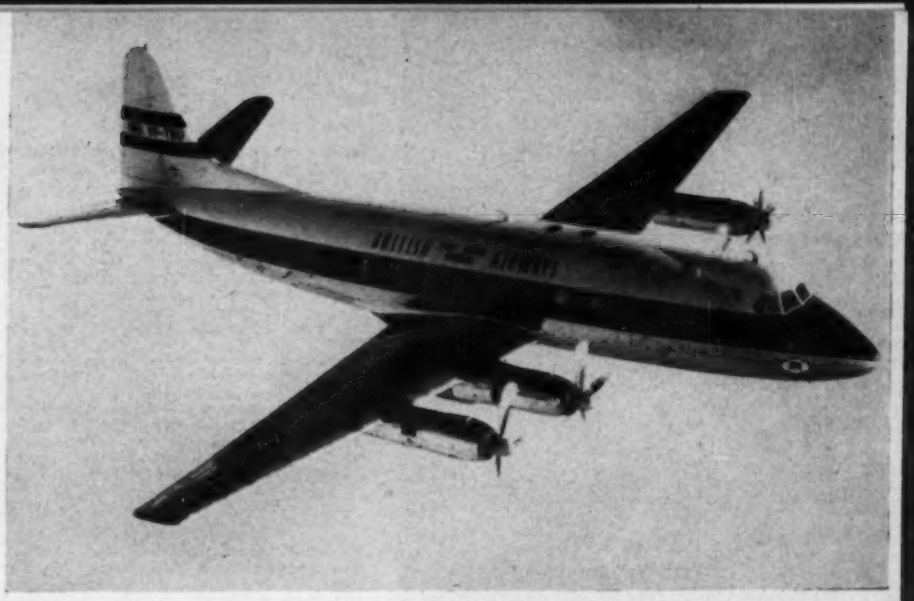
Butler Air Transport, Ltd., was founded in 1934 to operate a Charleville - Cootamundra service connecting with the Imperial Airways-Qantas England - Australia route. The airline was registered as a public company in 1952 and a large proportion of the stock is owned by company staff, a factor which has prevented Ansett-A.N.A. from obtaining a controlling share. In 1947 Butler acquired control of Queensland Airlines. Butler Air Transport operates about 9,000 miles of routes from Sydney to towns in New South Wales, with some short penetrations into Queensland.
Head Office: Sydney, N.S.W., Australia.
Executives: R. Ansett, chairman/managing director; T. Williams, general manager; T. R. Young, operations manager.
Fleet: two Viscount, three DC-3, three Ambassador.

BWIA—see British West Indian Airways.

Byerly Airlines operates a daily service from Jacksonville, Illinois, to Peoria where it connects with T.W.A. flights to and from Chicago.
Head Office: Peoria, Ill., U.S.A.
Executives: R. M. Byerly, president; W. M. Staker, vice-president; J. Seamon, treasurer.
Fleet: Lockheed Electra, Beech Bonanza.

C.A.A.C.—see Central African Airways Corporation.

California Central Airlines was founded in 1947 as an intrastate carrier and now operates services linking San Diego, the Los Angeles airports, San Francisco and Oakland. At one period the company was operating some Martin 2-0-2s but following financial difficulties and disputes with the C.A.B., these aircraft were disposed of.
Head Office: Burbank, Cal., U.S.A.
Executives: Col. C. C. Sherman, president/director of operations; E. K. Sherman, secretary/treasurer.
Fleet: two DC-3, two C-46.



British West Indian Airways Viscount 772s serve the Caribbean and New York and Miami.

Campania Ecuatoriana de Aviacion is a new airline in Ecuador. The company flies from Miami to Lima. Agreements with Aerolineas Peruanas and Aerolineas Argentinas allow a cheap-fare through service from the U.S. to Buenos Aires.
Head Office: Quito, Ecuador.
Fleet: two C-46.

Canadian Pacific Air Lines, Ltd., was founded in 1942 by the Canadian Pacific Railway to acquire ten of the "bush" airlines, best known of which was Canadian Airways. C.P.A.L. operated a network of services in west and northwest Canada; a smaller network in the Winnipeg area; and a third system in Quebec and Labrador. These were part of the overall C.P.R. system including railways and ships. In 1949 the company opened two trans-Pacific routes, the first via Honolulu, Canton and Fiji to Sydney, and the second via Anchorage, Shemya and Tokyo to Hong Kong. In 1955 a trans-Polar route was opened between Vancouver and Amsterdam. The eastern Canada services have now been taken over by T.C.A. In 1957 a transatlantic route was opened to Madrid and Lisbon. The airlines' main trunk routes now extend from Sydney and Auckland to Amsterdam via Fiji, Honolulu and Vancouver and from Buenos Aires to Hong Kong via Lima, Mexico City, Vancouver and Tokyo. There are also services between Madrid and Mexico via Toronto and Montreal. C.P.A.L. has applied to operate in competition to T.C.A. between Canada's east and west coasts.
Head Office: Vancouver, B.C., Canada.
Executives: G. W. G. McConachie, president; R. W. Ryan, executive vice-president; H. B. Renwick, vice-pres. traffic; R. B. Phillips, vice-pres. operations.
Fleet: 10 DC-6B, one DC-4, five Convair 240, eight Curtiss C-46F, 13 DC-3, two Canso, two Otter. On order: five DC-6B (1958), five Britannia 314 (1958), option on further five Britannia (1959/60).

Capital Airlines, Inc., can trace its history back to April 1927 when Skyline Transportation Company began flying mail between Pittsburgh and Cleveland. The following year Skyline was taken over by Pennsylvania Airlines and passenger services were begun. In 1936 Pennsylvania Airlines and Central Airlines (then flying Detroit - Washington mail services) merged to form Pennsylvania-Central Airlines. The present name was adopted in 1948. Capital was a pioneer of air coach services and also the first U.S. airline to introduce turbine-powered aircraft, having placed orders for a total of 60 Viscounts. Capital has a large route network in the eastern, north eastern and southern states.
Head Office: Washington, D.C., U.S.A.
Executives: J. H. Carmichael, president; R. G. Lochiel, vice-pres./treas.; J. B. Franklin, vice-president operation.
Fleet: 58 Viscount, 12 Lockheed L-049, 14 DC-4, 20 DC-3.

Capitol Airways is one of the leading U.S. large irregular carriers. This company recently applied unsuccessfully for a permit to operate scheduled services between the Great Lakes region and Florida.
Head Office: Nashville, Tennessee, U.S.A.
Executive: J. F. Stallings, president.
Fleet: 16 C-46, one L.749.

Caribbean-Atlantic Airlines, Inc.—Caribair was founded in 1939, and in June that year took

Braniff's DC-7C service is named "El Dorado." The airline has ordered Electras and Boeing 707s.

Capital are among the world's largest operators of Vickers-Armstrongs Viscounts.

WORLD AIRLINE DIRECTORY...

over the operations of its predecessor, Powelson Air Service, which had started scheduled services late in 1938. The company now operates services within Puerto Rico and to the Dominican Republic and the Virgin Islands.
Head Office: San Juan, Puerto Rico.
Executives: D. Trigo, president; J. Sierra, vice-president operations; R. B. Forrest, vice-president traffic; B. Trigo, vice-president.
Fleet: five DC-3.

Caspar, Ltd., has for several years been operating scheduled services round Lake Victoria in association with East African Airways. Services are now operated from Entebbe to Bukoba, Geita and Mwanza.
Head Office: Nairobi, Kenya.
Executives: L. Campling, F. Campling, H. Vanderwal, directors; C. Bramich, secretary.
Fleet: three D.H.89, one Cessna 182, two Bonanza, one Navion, one Piper.

C.A.T.—see Civil Air Transport.

Catalina Pacific Airlines operates from Los Angeles International Airport to Catalina Island through its Catalina Airlines Division and from Los Angeles to Palm Springs through its Palm Springs Airlines Division. In 1931 Catalina Island began to receive air transport when Wilmington Catalina Airline opened a service from Wilmington, Cal.
Head Office: Beverly Hills, Cal., U.S.A.
Fleet: two Dove, one DC-3.

Cathay Pacific Airways, Ltd.—C.P.A. was founded in 1946 and reorganized in 1948, when 80 per cent of the stock was acquired by Butterfield and Swire and associated shipping comoanies, and Australian National Airways. Further reorganization gave the Butterfield and Swire group 52 per cent, Peninsular and Oriental Steam Navigation Co. 30 per cent, Australian National Airways 14 per cent and The Borneo Co., Ltd., 4 per cent. The Hong Kong government, in 1949, gave Cathay Pacific Airways rights for the operation of routes south of Hong Kong. Routes are operated to Bangkok, Calcutta, Labuan, Manila, Rangoon, Saigon and Singapore.
Head Office: Hong Kong.
Executives: J. A. Blackwood, chairman; H. J. Browne, managing director; D. R. Y. Bluck, traffic manager; C. P. Moore, operations manager; K. W. Steele, flight superintendent; J. T. Gething, chief engineer.
Fleet: one DC-6, one DC-4, one DC-3. On order: one DC-6B (1958), two Electra.

Causa—see Compania Aeronautica Uruguaya, S.A.

C.C.T.A.—see Royal Air Maroc.

C.D.A.—see Compania Dominicana de Aviacion.

Central African Airways Corporation, formed in 1946 by the Governments of Northern and Southern Rhodesia and Nyasaland, C.A.A. is successor to the war-time Southern Rhodesia Air Services and the pre-war Rhodesia and Nyasaland Airways. In addition to domestic services C.A.A. operate services to the Union of South Africa, Kenya, Tanganyika, the Belgian Congo and Portuguese East Africa. After having come to an agreement with B.O.A.C., services by C.A.A.C. to Europe have now been stopped.
Head Office: Salisbury, Southern Rhodesia.
Executives: M. Stuart-Shaw, general manager; K. H. Greager, engineering manager; R. A. Bourlay, operations manager; R. P. Hartley, secretary/chief accountant; H. D. Gray, traffic manager; W. L. Stedman, sales manager.
Fleet: five Viscount 748, two Viking, five DC-3, six Beaver.

Central Airlines, Inc., was founded as an intrastate operator in Oklahoma in 1944. The company's first inter-state operations were authorized in 1946 and operations, with Beech Bonanzas, were inaugurated in September 1949. DC-3 operations began in 1950 and all Bonanzas were withdrawn during the following year. At present the airline has a route mileage of 3,299 serving 33 cities in Texas, Oklahoma, Arkansas, Kansas, Missouri and Colorado.
Head Office: Fort Worth, Texas, U.S.A.
Executives: K. H. Kahle, president; F. E. Howe, executive vice-president/treasurer; A. S. Aldridge, vice-president traffic and sales; C. E. Jundstrom, secretary.
Fleet: 13 DC-3.

Central Northern Airways—see Trans-Air, Ltd.

Ceskoslovenské Aerolinie—CSA is the Czech State airline which was founded in 1946 as successor to the C.S.A. established in 1923 and which, until the war, operated in competition with C.L.S. The airline now operates domestic services and to Belgrade, Berlin, Bucharest, Budapest, Copenhagen, Helsinki, Moscow, Paris, Prague, Sofia, Stockholm, Vienna, Zürich, Brussels, Vilno and Warsaw. The Tu-104 will be placed into international services by C.S.A. this year on routes from Prague to Paris and Brussels.
Head Office: Prague, Czechoslovakia.
Executives: Josef Procházka, general manager; Al. Palichleb, deputy general manager; J. Barcal, commercial manager.
Fleet: 21 DC-3, seven Li-2, eight Il-12, 10 Il-14, three Tu-104.

C.G.T.A.—see Compagnie Generale de Transports Aériens Air Algérie.

Chicago Helicopter Airways, Inc., has authorization to operate helicopters to any point within 50 miles of Midway Airport, Chicago, and has since 1949, as Helicopter Air Service, Inc., been operating shuttle mail services between the roof of the main Chicago post office and Chicago Municipal Airport. This shuttle is operated at high frequency and, in addition, a number of mail flights are made on weekdays over three circuits, each of which serves a large area. Under its new title the company began scheduled passenger services on November 12, 1956, between O'Hare and Midway Airports, and downtown Chicago.
Head Office: Chicago, Ill., U.S.A.
Executives: John S. Gleason, Jnr., president/treasurer; C. W. Moore, executive vice-president; John C. Brogan, vice-president/secretary; Robert S. Angstadt, vice-president operations; Robert B. Kiel, asst. secretary/treasurer.
Fleet: three S-55, three Bell 47G, three S-58.

CINTA—Cia. Nacional de Turismo Aereo (Chilean Airlines), is a new company operating low-fare services between Santiago and New York via Arica, Talara and Panama using DC-4s. Internal services are flown with DC-4s and DC-3s. CINTA and ALA are discussing a merger.
Head Office: Santiago, Chile.
Executives: A. Edwards, president; J. Costabal, general manager; C. Vallejo, secretary general; K. Rosene, technical manager.
Fleet: two DC-4, two C-46, DC-3, two Lockheed 10, two Bonanza.

Civil Air Transport—C.A.T. was founded by Maj-Gen. Chennault, leader of the A. V. G. Flying Tigers, and Whiting Willauer on October 25th, 1946, as C.N.R.R.A. Air Transport for the carriage of famine relief supplies to China. From 1947 commercial loads were allowed on return flights. After a series of moves forced by the Communist advance through China C.A.T. moved to Formosa in 1950. The airline, in addition to charter work in various parts of the world, operates round-the-island passenger and cargo services and international flights to Japan, South Korea, Manila, Hong Kong and Bangkok. C.A.T. is closely associated with the Asiatic Aeronautical Co.
Head Office: Taipei, Taiwan (Formosa).
Executives: Wang Wensan, chairman; H. L. Grundy, managing director; A. Hiatt, treasurer; W. M. French, secretary.
Fleet: two DC-4, 23 Curtiss C-46, five DC-3, two PBY Catalina.

C.M.A.—see Compania Mexicana de Aviacion, S.A.

C.O.H.A.T.A.—see Compagnie Haitienne de Transports Aériens.

Commercial Air Services (Pty.), Ltd., was founded in 1943 as a charter operator. Regular services were begun in 1948. At present C.A.S. flies twice a week between Bulawayo and Wankie; 11 times a week Johannesburg-Welkom; and once on Saturdays Welkom-Durban. The scheduled services are flown by Lodestar and Cessna 170 aircraft. C.A.S. is associated with Airwork, Ltd., London.
Head Office: Johannesburg, Transvaal, Union of South Africa.
Executives: J. M. S. Martin, operations manager; L. Zimmerman, commercial manager.
Fleet: three Lodestar, two Cessna 180, two Cessna 170, one Cessna 140.

Compagnie Cherifienne de Transports Aerienne—see Royal Air Maroc.

Compagnie de Transports Aériens Intercontinentaux—T.A.I. was formed after World War II as a charter operator, closely associated with shipping companies and later established regular scheduled services to various parts of Africa, Madagascar and Saigon. A redistribution of French air routes became effective on January 1 this year and T.A.I. has been allotted 60 per cent of the traffic between France and North Africa and the eastern part of French West Africa; 50 per cent to Djibouti, Madagascar and Reunion; and 10 per cent between France and Morocco.
The company has also been made responsible for the development of French services to Indonesia, Ceylon, Australia and New Caledonia. The Air France services to Australia and New Caledonia were taken over in 1956 and early this year a new route was opened to New Zealand.
Head Office: Paris, France.
Executives: P. Bernard, president; General G. Fayet director-general; M. Mathieu, secretary - general; M. Gaffie, commercial director.
Fleet: four DC-6B, three DC-7C, one DC-6, five DC-3. On order: two DC-8.

Compagnie Générale de Transports Aériens Air Algérie was formed in 1953 by the merging of the original Air Algérie and Cie. Air Transport. The controlling interest in C.G.T.A. Air Algérie is held by Cie. Gle. Transatlantique in association with Cie. de Navigation Mixte. Services are operated within Algeria and from Algeria to Palma, numerous places in France and to Geneva.
Head Office: Algiers, Algeria.
Executives: J. Lignel, president; L. Adida, general manager.
Fleet: two Constellation, seven DC-4, three DC-3, two SO 30P Bretagne, two DC-6B.

Compagnie Haitienne de Transport Aérien (COHATA) is the recent successor to Corps d'Aviation de l'Armée d'Haiti, a military transport organization founded in 1942, and which began mail carriage in the following year and passenger services in 1944. Cohata operates a 600-mile domestic route network.
Head Office: Port au Prince, Haiti.
Executives: A. Maignan, commandant; Capt. P. Nicolas, assistant commandant operations.
Fleet: DC-3, Stratoliner.

Cubana are to add four Viscount 818s to their existing fleet of three V.755s.

Compagnie Nationale AIR FRANCE is believed to have the largest unduplicated route mileage of any airline. The company was formed in August 1933 by the merging of Air Union, S.G.T.A., and C.I.D.N.A. and the purchase of Aéropostale. Some of the Air France constituents can claim operating experience back to 1919. French air transport has a great history and was early in establishing European air services and services to Africa. The pioneering by French airlines of mail services in South America and later across the South Atlantic is one of the great stories of aviation. In addition to these routes a system of Mediterranean services was established and the route to Indo-China was opened as early as 1932. Air France now has about 170,000 miles of routes in Europe and Africa and to North and South America, the Near, Middle and Far East. Early in 1958 a one-stop polar service to Tokyo (via Anchorage) was inaugurated. Operations range from the de luxe services to America and the Far East (with Super Constellations) to what might be termed desert bus services. The company also operates the French internal night mail services, which have achieved a very high standard of regularity and reliability frequently in extremely bad weather when all other flying has ceased.
Head Office: Paris, France.
Executives: M. Hymans, chairman; L. Lesieux, president; M. Lemoine, vice-president; R. Dupre, vice-president technical; R. Montarnal, vice-president economics.
Fleet: 10 L.1649A, 13 L.1049G, nine L.1049E, 16 L-749A, 11 Viscount, 12 Provence, 22 DC-4, 39 DC-3. On order: 12 Caravelle (plus 12 on option), 17 Boeing 707 (1959/60).

Compania Aeronautica Uruguaya, S.A.—Causa, was founded in 1936 and in 1938 opened a route between Montevideo and Buenos Aires, using Junkers Ju52/3m seaplanes. In 1943 Causa opened a second route across Rio de la Plata, from Colonia to Buenos Aires. Sandringham flying-boats are used on both routes. The Montevideo-Buenos Aires route is flown in pool with Aerolineas Argentinas, with the Uruguayan company flying 10 services a week. The Colonia route is flown once each way on weekdays.
Head Office: Montevideo, Uruguay.
Executives: J. A. Beisso, president; T. L. Borges, managing director; O. M. Rodriquez, secretary.
Fleet: three Short Sandringham.

Compañia Cubana de Aviacion, S.A.—Cubana, was founded in 1929 as Compañia Nacional Cubana de Aviacion Curtiss, S.A., for the operation of a school and charter services. Scheduled services were begun in 1930. Pan American obtained 100 per cent control of the company in 1932. P.A.A.'s holding was subsequently much reduced until in 1953 it was only 20 per cent, and it has now withdrawn from Cubana. The company now flies domestic services and also routes to Mexico, U.S.A., Haiti, Bermuda, Portugal and Spain. In order to meet the fierce competition in the area, Cubana has now introduced Viscounts.
Head Office: Havana, Cuba.
Executives: J. L. Vilaboy, president; J. M. Palli Daiz, vice-president/general manager; I. Calderin, treasurer; A. P. Beniton, secretary.
Fleet: three L.1049G, three Viscount 755, one L.049, six DC-3. On order: four Viscount 818, two Britannias, two Boeing 707.

Compañia de Aviación "Faucett" S.A., is one of the oldest South American airlines, having been founded in 1928. The company now flies over 4,000 miles of internal routes and it is one of the few airlines which operates aircraft of their own manufacture: about 30 Faucett-built Stinsons were produced, and four of these are still used by the airline. The company's honorary president was the original founder.
Head Office: Lima, Peru.
Executives: E. J. Faucett, hon. president; E. Dibos, president of the board; A. Bentin, managing director.
Fleet: four DC-4, nine DC-3, four Stinson-Faucett.

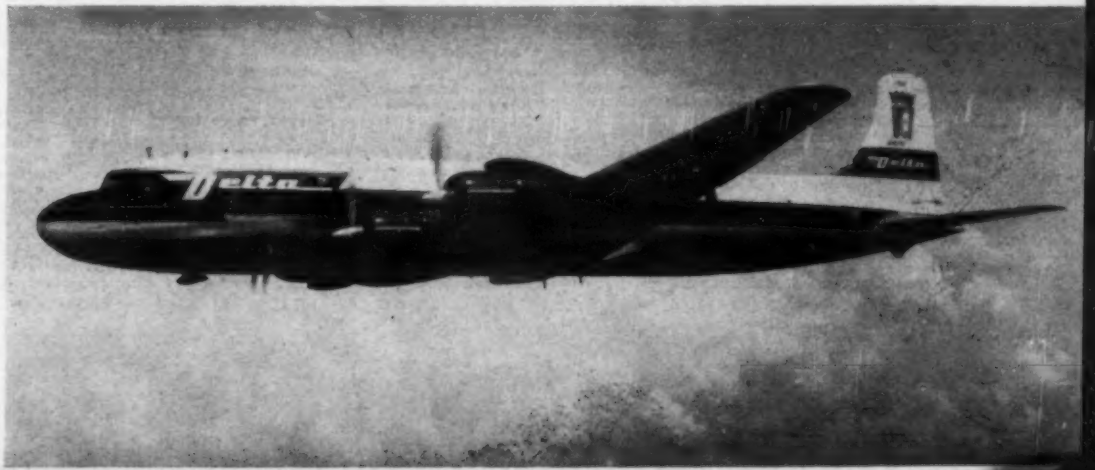
Compañia Dominicana de Aviacion, S.A., was founded in 1944 by local interests and Pan American Airways. Scheduled domestic operations began that year. The company has a domestic route network and also flies from Ciudad Trujillo to Port Au Prince in Haiti and to Miami, Florida.
Head Office: Ciudad Trujillo, Dominican Republic.
Executives: C. A. McLaughlin, president/general manager; F. P. Powers, vice-president.
Fleet: two DC-3, five C-46, one Beaver.

Compañia Mercantil Anónima IBERIA, Lineas Aéreas Españolas, was established in 1940 as successor to L.A.P.E. Originally the Spanish Government owned 51 per cent of the capital with other Spanish interests and Deutche Lufthansa holding the other 49 per cent. All stock was subsequently acquired by the Government. Iberia began as a domestic operator but has in addition to its internal services others to London, Paris, Frankfurt, Geneva, Rome and Lisbon. Long distance services are operated to New York, Mexico, Venezuela, Buenos Aires and Spanish possessions in Africa and off the coast of that continent.
Head Office: Madrid, Spain.
Executives: D. Tomás Delgado, chairman; D. C. G. Lucia, general manager; F. Iglesias, chief engineer; J. M. Ansaldo, chief flight operations; J. Viniegra, general secretary.
Fleet: five L.1049C, six DC-4, 16 DC-3, four Bristol 170, five Convair 440.

Compañia Mexicana de Aviacion, S.A., was founded on August 20, 1924, to carry pay-roll gold from Tampico to the oil fields in the State of Veracruz, thus avoiding the bandits who had been attacking the paymasters travelling by surface. The original fleet consisted of single-engined Lincoln Standard biplanes. In 1929 Pan American Airways acquired 100 per cent of C.M.A.'s stock but this holding was subsequently considerably reduced. C.M.A., now the main Mexican airline, operates a network of services within Mexico and to Los Angeles and Havana. Scheduled freight services are also operated within Mexico and to Los Angeles.
Head Office: Mexico, D.F.
Executives: A. Sáenz, president; P. A. Chapa, vice-president; C. F. Osuna, vice-president; R. I. Pérez, treasurer; A. Flores, secretary; E. R. Silliman, general manager; M. H. Jones, operations manager; F. O. Willy, traffic and sales manager.
Fleet: four DC-7C, four DC-6, six DC-4, 19 DC-3, four Fairchild C-82A.

Compania Panamena de Aviacion, S.A.—COPA., an affiliate of Pan American World Airways, was founded in 1944 by P.A.W.A. and Panamanian interests, with the U.S. line holding 40 per cent of the stock. This holding has since been reduced. Scheduled services were begun in 1948. The company now operates a system serving various poir.ts in Panama and San Jose in Costa Rica and Bogota, Colombia.
Head Office: Panama City, Panama.
Executives: C. Icaza, president; R. Huertematte, secretary; F. Icaza, vice-president.
Fleet: two DC-3, two C-46.

Connellan Airways, Ltd., became a limited company in 1951 but operations were begun in August 1939 when E. J. Connellan started flying a fortnightly 1,184-mile route serving nearly a score of places between Wyndham and Alice Springs; he used a Percival Gull. Now the company operates extensive local services based on Alice Springs and the unduplicated route mileage is about 8,000.
Head Office: Alice Springs, N.T., Australia.
Executives: E. J. Connellan, governing director; I. M. Leslie, manager.
Fleet: one D.H.89, two Beech 18, one Beech 17, two Tiger Moth, two Cessna 180. On order: one Cessna 180.



Like most other American airlines, Delta have an attractive livery, here displayed to advantage on a DC-7.

WORLD AIRLINE DIRECTORY...

Continental Air Lines, Inc., counts its history as dating from July 15, 1934, when Varney Speed Lines began a service between El Paso and Pueblo with Lockheed Vegas. In December that year the Southwest Division of Varney Speed Lines became Varney Air Transport and on July 1, 1937, the company became Continental Air Lines. Earlier in 1937 the Denver-Pueblo route of Wyoming Air Service (Inland Air Lines) was purchased. The company's latest acquisition, in 1954, was Pioneer Air Lines, which began service in 1945. Pioneer's routes measured 2,000 miles and served 22 cities in Texas and New Mexico. Continental now serves a population of 19 million people in the area bounded by Kansas City and Denver in the north and El Paso and Houston in the south. Throughplane agreements give access to Seattle, California, and St. Louis.
Head Office: Denver, Colorado, U.S.A.
Executives: L. H. Mueller, chairman; R. F. Six, president; C. C. West, jnr., exec. vice-pres.; O. R. Haueter, vice-president operations; C. H. Calhoun, vice-president, engineering and maintenance; J. A. Uhl, vice-president/treasurer; S. B. Redmond, secretary.
Fleet: three DC-3, six Convair 340, three Convair 440, three DC-6B, four DC-7B; leased aircraft, 10 DC-3, one DC-6B, one DC-6. On order: one DC-7B, 15 Viscount 812 (1958), four Boeing 707 (1959).

COPA—see Compania Panamena de Aviacion, S.A.

Cordova Airlines, Inc., began operations in 1934 and now operates services in the Anchorage-Cordova-Seward area and as far north as Fairbanks.
Head Office: Anchorage, Alaska.
Executives: M. K. Smith, president; D. P. Swanson, vice-president operations.
Fleet: two DC-3, three Cessna 170, one Cessna 180, two Grumman Widgeon, one C-46.

Correio Aereo Nacional is a transport branch of the Brazilian armed services and it is responsible for the operation of air services to areas of Brazil which would not justify commercial airline operation. Operations were begun in 1931 and by 1954 more than 45,000 miles of routes were in operation. In addition to domestic operations this military airline serves points in Bolivia, French Guiana, Paraguay, Peru and Uruguay.
Fleet: approx. 40 DC-3, 20 Beech 18, eight Bonanza, two Canso.

Cosara—see Société de Transports Aériens en Extrême Orient.

Cruzeiro—see Serviços Aéreos Cruzeiro do Sul, S.A.

C.S.A.—see Ceskoslovenské Aerolinie.

Cuba Aeropostal, S.A., operates services within Cuba.
Head Office: Havana, Cuba.
Executives: G. E. Alfonso, president; Dr. J. M. B. Goas, secretary.
Fleet: three C-46.

Cubana—see Compañia Cubana de Aviacion, S.A.

Currey Air Transport, Ltd., is registered as a U.S. supplemental air carrier and has advertised services serving Oakland, Burbank, San Diego, St. Louis, Chicago, Detroit, Philadelphia, New York and Boston.
Head Office: Oakland, Cal., U.S.A.
Executives: A. R. Currey, president; G. D. Thompson, vice-president.
Fleet: DC-6B, DC-4.

Cyprus Airways, Ltd., was founded in 1947 by B.E.A., the Cyprus Government and private interests. The British airline holdings are now 23 per cent each by B.E.A. and B.O.A.C. B.E.A. provides Viscounts under a hire agreement for certain services between Nicosia and Beirut, Nicosia and Athens and Nicosia and Tel Aviv. These form part of the joint operation of the B.E.A./Cyprus Airways London-Athens-Nicosia/Beirut/Lydda route. From January this airline's services were provided by B.E.A. The fleet of four DC-3s is in the process of disposal.
Head Office: Nicosia, Cyprus.
Executives: Dr. C. Raeburn, chairman; J. A. Vick, general manager; B. G. Cooper, secretary; S. M. Killingbeck, commercial manager; J. G. Williams, chief engineer.

"De Kroonduif"—see Nederlands Nieuw Guinea Luchtvaartmaatschappij "De Kroonduif" N.V.

Delta Air Lines, Inc., re-entered the airline business in 1934 after a break of four years following its pioneering of services in 1929 between Birmingham and Dallas. In 1953 the company took over Chicago and Southern Air Lines (founded in 1934) and for some time the company worked as Delta-C & S Air Lines. Delta has an extensive network stretching from New York, Detroit and Chicago in the north to Houston, New Orleans, Miami, Havana, San Juan and Caracas in the south. Westwards the network goes to Kansas City, Dallas and Fort Worth, while throughplane agreements provide service to Los Angeles, San Diego and San Francisco.
Head Office: Atlanta, Ga., U.S.A.
Executives: C. E. Woolman, president/gen. mgr.; R. W. Freeman, chairman of the board; L. C. Parker, vice-pres. traffic and sales; C. H. Dolson, vice-president operations; T. G. Cole, vice-president finance.
Fleet: 17 DC-7, four DC-7B, 20 Convair 340, seven DC-6, four Constellation, eight Convair 440, five C-46, 15 DC-3. On order: eight DC-8 (1959/60), 10 Convair 880 (1959/60).

D.E.T.A.—see Divisao de Exploraçao des Transportes Aéreos.

Det Danske Luftfartselskab A/S—No longer an operating company, D.D.L. began services in 1920, flying from Copenhagen to Berlin. Prior to the suspension of operations in 1939 the route network was spread widely over Europe. From 1946 various efforts were made to operate jointly with D.N.L. (Norway) and A.B.A. (Sweden), culminating in 1950, with the creation of S.A.S. in which D.D.L. has a 2/7 (28.6 per cent) share. D.D.L. capital is held 52 per cent by the Government, 15 per cent by the Copenhagen municipality, and 23 per cent by private interests.

Deutsche Flugdienst G.H.B.H.—D.F.G. is one of the leading German non-scheduled carriers. At one time D.F.G. had a management contract with Airwork, Ltd.
Head Office: Frankfurt, W. Germany.
Executives: E. von Brauchitsch, managing director.
Fleet: five Vikings.

Deutsche Lufthansa. This is a new company, not to be confused with the West German airline, which was set up in 1955 under an agreement between the East German Democratic Republic and the U.S.S.R. The company receives technical assistance from the U.S.S.R. In addition to internal services international services are operated from Berlin to Bucharest, Belgrade, Moscow, Prague, Sofia, Warsaw and Wilno.
Head Office: Berlin, German Democratic Republic.
Fleet: About 50 Il-12, AN-2 and Il-14.

Deutsche Lufthansa, A.G., describes itself as "a new airline with an old tradition." This is apt, as although the new airline began internal operations on April 1, 1955, services to London on May 16 and to New York on June 8 that year, the original D.L.H. was founded in January 1926 and its winged crest originated with Deutsche Luftreederei in 1919.
The new Lufthansa operates a small internal network, European services to London, Paris, Madrid and Lisbon, North Atlantic services to New York, Montreal and Chicago, South Atlantic services to Brazil and Argentina, and Middle East services to Lebanon, Syria, Iraq and Persia.
Head Office: Cologne, Germany.
Executives: Dr. K. Weigelt, chairman; H. M. Bongers, commercial director; Dipl. Ing. G. Höltje, technical director.
Fleet: nine L.1049G, four L.1649A, four Convair 340, five Convair 440, three DC-3, two Safir, two Beech Bonanza. On order: nine Viscount V.814 (1958/59), four Boeing 707 (1960/61).

D.F.G.—see Deutsche Flugdienst G.M.B.H.

Divisao de Exploraçao des Transportes Aéreos—D.E.T.A. was organized in 1936 by the Colonial Government of Mosambique as a division of the Department of Railways, Harbours and Airways. Domestic services are operated and there are routes to Durban, Johannesburg and Salisbury.
Head Office: Lourenco Marques, Mozambique.
Executives: A. P. Pereira Leite, director general; A. H. Pinho da Cunha, manager; M. A. Cardosa Barata, acting manager.
Fleet: three DC-3, three Lodestar, six Dove, two Ju 52/3m, four D.H.89, one D.H.90, two **D.H.87.**

Divisao dos Transportes Aéreos—DTA was founded in 1938 as a division of the Ports, Railways and Transport Administration in Portuguese West Africa. Operations began in 1938 and at present DTA operates a network of domestic services and also a route between Luanda and Leopoldville. During 1951 the Leopoldville route was extended to Lourenço Marques but was abandoned as a result of poor load factors.
Head Office: Luanda, Angola.
Executives: Eng. P. Jeite, president; J. de S. Medina, managing director.
Fleet: six DC-3, four Beech 18, three D.H.89.

East African Airways Corporation came into being in 1946; it is responsible for the development of air transport in the three territories of Kenya, Uganda and Tanganyika and each Territory is represented on the board, as is B.O.A.C. The corporation is successor to the pre-war Wilson Airways. E.A.A.C. operates a network of services in the three Territories and to South Africa. In 1957 three Argonauts were bought from B.O.A.C. to operate between London and Nairobi.
Head Office: Nairobi, Kenya.
Executives: Col. M. C. P. Mostert, general manager; A. V. Gill, asst, gen. mgr./secretary; Capt. E. E. Morris, operations manager; A. E. Robinson, engineering manager; P. A. Travers, sales manager; S. G. Choppin, chief accountant.
Fleet: nine DC-3s, four D.H.89, four **Argonaut.**

Eastern Air Lines, Inc., is one of the largest U.S. carriers and its history goes back to 1927 when Pitcairn Aviation successfully bid for a mail contract between New York and Atlanta. The carrier's name became Eastern Air Transport in 1930, following North American Aviation's acquisition of Pitcairn in the previous year. New York Airways and Ludington Air Lines were acquired in 1931 and 1933 respectively. North American sold its holdings in 1938.
E.A.L. now has an extensive route system throughout the Eastern States serving Boston, Detroit and Chicago at the northern extremities; St. Louis, Memphis and San Antonio in the west; and Mexico City and Puerto Rico at the southwest and southeast corners of the network. Throughplane service with Braniff reaches to Rio de Janeiro and Buenos Aires via the west coast of South America. Other throughplane services extend to Minneapolis/St. Paul, Kansas City and Denver. Eastern, after a long fight, acquired Colonial Airlines in June 1956 thus gaining routes to Ottawa, Montreal and Bermuda. In 1957 Eastern ousted American Airlines from their position as the world's largest airline in terms of passengers carried.
Head Office: New York, U.S.A.
Executives: E. V. Rickenbacker, chairman/general manager; T. F. Armstrong, president; P. H. Brattain, first vice-president; T. E. Creighton, treasurer; F. L. Farley, secretary.
Fleet: 50 DC-7B, 20 Convair 440, 18 L.749, 28 L-1049, 10 L-1049G, 58 Martin 4-0-4, one DC-4. On order: 40 Electra, 20 DC-8 (1959-60),

East-West Airlines, Ltd., founded in 1947 to provide feeder services between inland districts and Brisbane and Sydney. Services between Tamworth and Sydney were opened in that year and to Brisbane in 1948. The airline now serves eight inland points on this route and also operates services from Sydney to Cowra, Temora and West Wyalong.
Head Office: Tamworth, N.S.W., Australia.
Executives: D. M. Shand, chairman; Capt. A. J. Smith, general manager; R. O. Cooksey, administration manager; J. G. Riley, operations manager.
Fleet: three DC-3, two Lockheed 18. On order: one DC-3.

El Al Israel Airlines, Ltd., was incorporated in November 1948 and began services to European cities, including London, in 1949.

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Vickers Viscounts have been in passenger service with B.E.A. for exactly 5 years, and in this time have flown 50 million miles on BP turbine fuel. Now Viscounts are operated by the airlines of 25 other countries, too, and most of these have also been fuelled by the BP Aviation Service. In this time they have made an overwhelming impact on international transport, teaching people all over the world to demand new standards of quiet, vibrationless travel.

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WORLD AIRLINE DIRECTORY...

Routes to the U.S.A. and the Union of South Africa were opened in 1951. The Government of Israel has the majority holding in El Al; the shipping company Zim Israel Navigation Co., Ltd., also has a financial interest in the airline. El Al has a share in Arkia, an airline limited to domestic services within Israel.
Head Office: Tel Aviv-Yafo, Israel.
Executives: E. Ben Arzi, managing director; Y. Palgi, deputy managing director (production and operations); Dr. A. Rywkind, deputy managing director (commercial).
Fleet: four L.049 Constellation, three C-46, one Consul (training), three Britannia 313.

Ellis Air Lines was incorporated in 1940 but operations had been started as far back as 1936, when R. E. Ellis began flying with one Waco biplane. Routes are operated from Ketchikan to as far north as Sitka and Juneau. In 1952 a southward extension from Ketchikan to Prince Rupert gave Ellis Air Lines its first international operation.
Head Office: Ketchikan, Alaska.
Executives: R. E. Ellis, president; J. L. Sherman, vice-president maintenance; G. A. Bodding, vice-president operations.
Fleet: nine Goose, one Cessna 180, one Aeronca.

Empresa Guatemalteca de Aviacion—AVIATECA, was formed by the Guatemala Government in 1945 to take over Aerovias de Guatemala, which had been founded in 1939, and which began operating in 1940. The company operates about 3,700 miles of routes radiating from Guatemala City.
Head Office: Guatemala City.
Executives: Col. A. Gemmell, president; Col. J. R. Mendoza, operations manager.
Fleet: one DC-4, five DC-3, one Norseman, two C-46.

Empresa de Transportes Aereos Catarinense—TAC, operates scheduled services from Florianopolis to Xapico, Porto Elegre and Rio de Janeiro.
Head Office: Florianopolis, Santa Catarina, Brazil.
Executives: Dr. J. Lima, president; G. Lins, vice president.
Fleet: DC-3s.

Empresa de Transportes Aereos Norte do Brasil, S.A. (Aeronorte)—see REAL S.A. Transportes Aereos and Aeronorte.

Ethiopian Air Lines, Inc., is owned by the Ethiopian Government and managed by T.W.A. Services were begun in April 1946 and the present operations include services within Ethiopia and to Aden, Nairobi, Khartoum, Jeddah, Cairo and Athens. E.A.L. was for a time one of the few airlines using rocket-assisted take-off for passenger aircraft, a practice now discontinued.
Head Office: Addis Ababa, Ethiopia.
Executives: H. E. D.Z.G. Selassie, president and chairman; H. E. Ato Menasse Lemma, vice-president; V. H. Harrell, Jnr., general manager; M. F. Garrison, secretary/treasurer; H. F. Noon, general operations manager; D. P. Reid, general sales manager.
Fleet: three Convair 240, eight DC-3. On order: three DC-6B (1958).

Expreso Aereo Interamericano, S.A., Expreso operates limited internal services in Cuba.
Head Office: Havana, Cuba.
Executives: G. D. Rodriguez, president; Dr. E. Ilanso, secretary.

Far Eastern Airlines—see All Nippon Airlines.

Faucett—see Compañia de Aviacion-Faucett.

Federation Air Service began operation, in November 1951, of local services based on Kuala Lumpur. These link up numerous isolated areas and also act as feeder services. Federation Air Service is at present being taken over by Malayan Airways.
Head Office: Kuala Lumpur, Malaya.
Fleet: six Beaver.

Fiji Airways was founded in 1951 by Harold Gatty, who flew round the world in a Lockheed Vega with Wiley Post in 1931—they took just under nine days. Regular services within Fiji were begun in September 1951 using D.H.89s. Services are now operated between Nandi, the International Airport, Suva and Savusavu, Lambasa and Taveuni.
Head Office: Suva, Fiji.
Executives: H. Gatty, managing director; L. Dobbin, manager/chief engineer; P. Frame, chief pilot.
Fleet: three Drover, one Rapide.

Finnair—see Aero O/Y.

Flugfélag Islands h.f. (Icelandair), founded in 1937 as Flugfélag Akureyrar and began operation with one Waco biplane on floats. The present company name was adopted in 1940 and the name Icelandair has recently replaced the title Iceland Airways. In 1946 the company began services to Scandinavia and the United Kingdom. These were operated by Scottish Aviation for Iceland Airways until 1948 when the company introduced its own DC-4 aircraft. DC-3s and flying-boats serve a score of places in Iceland and DC-4s operate from Reykjavik to Copenhagen, Hamburg, Glasgow and London. Viscounts were added to the fleet in March this year.
Head Office: Reykjavik, Iceland.
Executives: G. Vilhjalmsson, chairman; B. Gislason, vice-chairman; O. O. Johnson, general manager; J. R. Snorrason, chief pilot; B. Tomasson, chief engineer; S. K. Matthiasson, traffic manager (international); H. Sigurdsson, traffic manager (domestic); S. Thorbjornsson, chief accountant; N. Simonarson, public relations officer.
Fleet: two Viscount 759, one DC-4, three DC-3, two PBY-5A Canso, one Goose.

Flying Tiger Line, Inc., The. Founded in June 1945 as National Skyway Freight Corporation. In addition to non-scheduled flying Flying Tiger Line operates coast-to-coast scheduled freight services. DC-6A flights include San Francisco - Chicago - Detroit - New York; Los Angeles - Chicago - New York; New York - Los Angeles non stop; and Detroit - Los Angeles - San Francisco, all operated every weekday. C-46s serve the following additional cities: Seattle, Portland, Minneapolis/St. Paul, Milwaukee, Cleveland, Buffalo, Binghamton, Philadelphia, Hartford and Boston. In 1954 an attempt to merge with Slick Airways had to be abandoned because of financial problems involved.
Head Office: Burbank, Cal., U.S.A.
Executives: R. W. Prescott, president; F. Benninger, vice-president/treasurer; F. B. Lynett, vice-president operations.
Fleet: two DC-4, two DC-6A, 11 C-46, 12 L.1049H (including two leased from another carrier).

Foshing Airlines operates internal services within Formosa.
Head Office: Taipei, Taiwan.
Executives: M. Chin, chairman; Ango Tai, president; H. Toy, vice-president traffic/sales; W. Tsiang, secretary.
Fleet: one Catalina, two C-47, one C-46.

Fred Olsen Airtransport, Ltd. is a subsidiary of the Olsen shipping company. No scheduled services are operated.
Head Office: Oslo, Norway.
Executives: R. Rynning, manager.
Fleet: four Viscount (leased to Austrian Airways), three C-46, two DC-3.

Frontier Airlines, Inc., acquired in June 1950 the temporary certificates of Arizona Airways, Challenger Airlines and Monarch Airlines, and is now operating a network of 3,500 miles in Colorado, Arizona, New Mexico, Utah, Wyoming, Montana and North Dakota.
Head Office: Denver, Colorado, U.S.A.
Executives: L. E. Leverone, chairman; C. A. Myhre, president; E. N. Levin, secretary; L. P. Blatter, treasurer; J. D. Lindsay, vice-president traffic and sales.
Fleet: 14 DC-3. On order: two Friendship and option on four.

Garuda Indonesian Airways N.V. is the State-owned Indonesian airline, which had been formed by the Government and K.L.M. as successor to K.L.M.'s post-war operations in the area and the pre-war K.N.I.L.M. Nationalization took place in 1954 when K.L.M.'s shares were bought up. Services are operated within and between the islands of the republic and to Singapore, Bangkok and Manila.
Head Office: Djakarta, Indonesia.
Executives: Dr. M. Soetoto, president; Dr. R. Sugoto, and D. K. van Houten, joint managing directors.
Fleet: three Convair 440, 20 DC-3, eight Convair 340, eight Convair 240. On order: three Electra.

Gibbes Sepik Airways, Ltd., are operators of scheduled and non-scheduled services in New Guinea. Junkers Ju52/3m purchased from Sweden were introduced into service in 1956.
Head Office: Goroka, Territory of New Guinea.
Executives: R. H. Gibbes, managing director; M. J. C. Gibbes, director; V. W. Cox, general manager/secretary; R. H. S. Gray, operations manager; E. Cross, chief engineer.
Fleet: six Norseman, three Ju52/3m. On order: one Cessna 180 (1958).

Gibraltar Airways, Ltd., formed in 1947 as a B.E.A. subsidiary with B.E.A. holding 51 per cent of the stock and M. H. Bland and Co., Ltd., holding the remainder. Operations between Gibraltar and Tangier and later to Spain and Spanish Morocco were maintained by D.H.89 aircraft. In October 1953 an agreement was concluded whereby B.E.A. undertakes all flying operations with a DC-3. Gibraltar Airways now operate only between Gibraltar and Tangier but the DC-3 also flies connecting services between Gibraltar and

Two Douglases of Hawaiian Airlines: a panoramic-windowed DC-3 and a DC-6.

WORLD AIRLINE DIRECTORY...

Madrid on certain days, thus providing higher frequency services to and from London.
Head Office: Gibraltar.
Executives: Sir George Gaggero, O.B.E., chairman; The Earl Amherst, M.C., deputy chairman; J. Victory, secretary.
Fleet: one DC-3 owned and operated by B.E.A.

Grupo del Transportes, also known as Transportes Aereos Militares (T.A.M.), operates some domestic services in Peru. Services are carried out by the Peruvian Air Force.
Head Office: Lima, Peru.
Executives: Col. C. Ramos, director; Capt. H. Diaz, technical manager.
Fleet: eight DC-3, six D.H.89, three Stinson, one Beechcraft, four Canso, four Beaver.

Guest Aerovías México, S.A., was founded in 1946 and in 1948 the company opened a service to Madrid but this was later abandoned. The company flies once weekly between Mexico City and Panama/Balboa. Constellations purchased from Qantas are used on this route, as well as on the daily service from Mexico to Miami.
Head Office: Mexico City, Mexico.
Executives: Winston Guest, president; G. L. Monteiro, vice-president/general manager; J. S. Nothnagel, general manager traffic/sales.
Fleet: one DC-4, two L.749A Constellation, two C-82 Packet, three DC-4.

Guest Airways—see Guest Aerovías México, S.A.

Guinea Airways, Ltd., now operate services mainly in South Australia with Adelaide as its headquarters. Originally formed in 1927, the company did remarkable work in the New Guinea goldfields until this was ended by the Japanese. A route had also been established from Darwin to Adelaide. After the war the newly formed State-owned Trans-Australia Airlines drove Guinea Airways off this route and caused its decline to the status of a small operator.
Head Office: Adelaide, South Australia.
Executives: S. Powell, chairman; C. A. Window, secretary; Capt. N. S. D. Buckley, chief pilot.
Fleet: five DC-3, two Auster.

Gulf Aviation Co., Ltd., was formed in 1950 by Mr. F. Bosworth. The company became a subsidiary of B.O.A.C. in the following year. Eighteen services a week are operated between Bahrein and Dhahran and there are also services from Bahrein to Doha, Abu Dhabi, Sharjah and Muscat.
Head Office: Bahrein.
Executives: G. B. Thompson, chairman; E. H. W. Lewis, executive director/secretary; K. H. N. Bulmer, chief pilot; E. C. Evemy, chief engineer.
Fleet: four Dove, two Heron. Additional Herons are being acquired from New Zealand National.

Hawaiian Airlines, Ltd., was founded in January 1929 as Inter-Island Airways. The Inter-Island Steam Navigation Company held 76 per cent of the original stock, services were begun in November 1929 and Sikorsky amphibian biplanes were used. The present title was adopted in 1941 and it was in that year that DC-3s were first introduced. The airline's services link Hawaii, Maui, Lanai, Molokai, Kauai and Honolulu (on Oahu island).
Hawaiian Airlines can claim two distinctions: they were the first American scheduled carrier to employ all-cargo aircraft on freight services, and their safety record is unique, the airline having never had a single fatal accident in the 28 years of operation since its foundation.
Head Office: Honolulu, Hawaii.
Executives: Stanley C. Kennedy, chairman; Arthur D. Lewis, president; Brian Cooke, vice-president/treasurer; Lionel D. Machado, vice-president operations; Jack C. Tobin, vice-president sales.
Fleet: five Convair 340, five DC-3, one DC-6C.

Hong Kong Airways, Ltd., was formed in 1947 to operate feeder services connecting main centres of China with B.O.A.C. trunk route at Hong Kong. A DC-3 service to Shanghai was opened in December 1947 and in 1948 routes were opened to Canton and Manila. After the Communist conquest of China Hong Kong Airways operated only to Formosa with aircraft chartered from Northwest Airlines but with the advent of its Viscounts this airline now also serves Manila, Seoul and Tokyo.
Head Office: Hong Kong.
Executives: H. D. M. Barton, chairman; Maj. R. H. Thornton, director; Hon. D. C. Geddes, director; Sir George Cribbett, director.
Fleet: two Viscount 760D.

Hunting-Clan African Airways (Pvt.), Ltd., an offshoot of Hunting-Clan Air Transport, operates services within the Federation of Rhodesia and Nyasaland and is described as "The Federation's Independent Airline." Third class passenger and cargo services are operated between Salisbury and Lusaka with compulsory break of journey at Kariba; and between Salisbury and Abercorn via Kariba, Lusaka, Ndola and Kasama. Inclusive tour services from Salisbury and Johannesburg to Vilanculos are operated in association with Fishair (Pvt.), Ltd. There is a weekly cargo service between Salisbury and Blantyre and a weekly cargo service between Salisbury and Nairobi as part of Hunting-Clan Air Transport's "Africargo" operation to and from London.
Head Office: Salisbury, Fed. of Rhodesia and Nyasaland.
Executives: C. Barnard, chairman; T. Lawler, general manager; D. Shaw, secretary.
Fleet: three D.H.89, two DC-3.

IBERIA—see Compañia Mercantil Anonima IBERIA.

Icelandair—see Flugfélag Islands.

Icelandic Airlines—see Loftleidir.

Illini Airlines, Inc., began operating services in March 1955 between Sterling, Illinois, and Meigs Field in downtown Chicago. Piper Apache aircraft were used and the original frequency was two round-trips on three days a week. Public demand made necessary the purchase of larger aircraft and two Doves were acquired in August and October 1955. The company now serves Detroit, Chicago, Rockford, Freeport and Rock Falls/Sterling with frequent services from Mondays to Fridays.
Head Office: Rockford, Illinois, U.S.A.
Executives: Douglas C. Harvey, president; John W. Bowman, first vice-president; Donald H. Swearingen, chief pilot; Leo Masiulis, passenger sales manager; Scott McCann, cargo sales manager.
Fleet: three Dove. On order: one Heron.

Indamer Airways—see Kalinga Airways.

Indian Airlines Corporation was formed in 1953, taking over on August 1 that year the services previously operated by a number of private airlines. Operating 23,600 miles of routes in India and to Afghanistan, Burma, Ceylon, Nepal and East and West Pakistan, the Corporation's operations are divided into three areas with bases at Bombay, Calcutta and Delhi.

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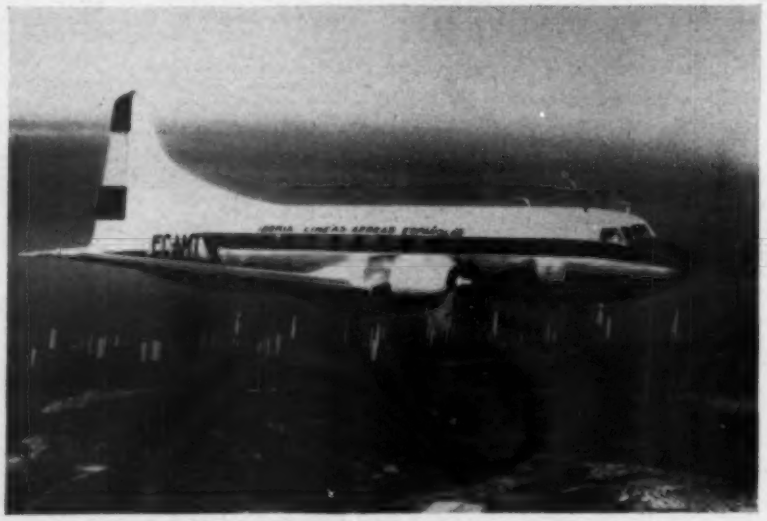

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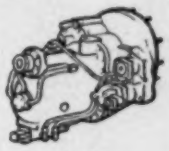

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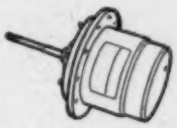

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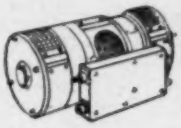

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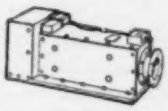
Alternators



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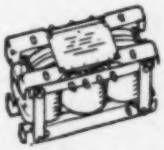

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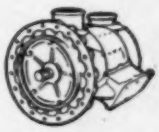

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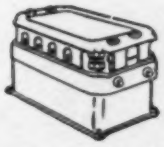
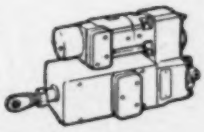
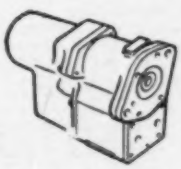


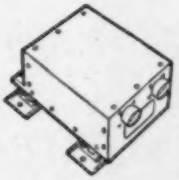
Circuit Breakers



Linear Actuators



Rotary Actuators



Alternator Control Gear

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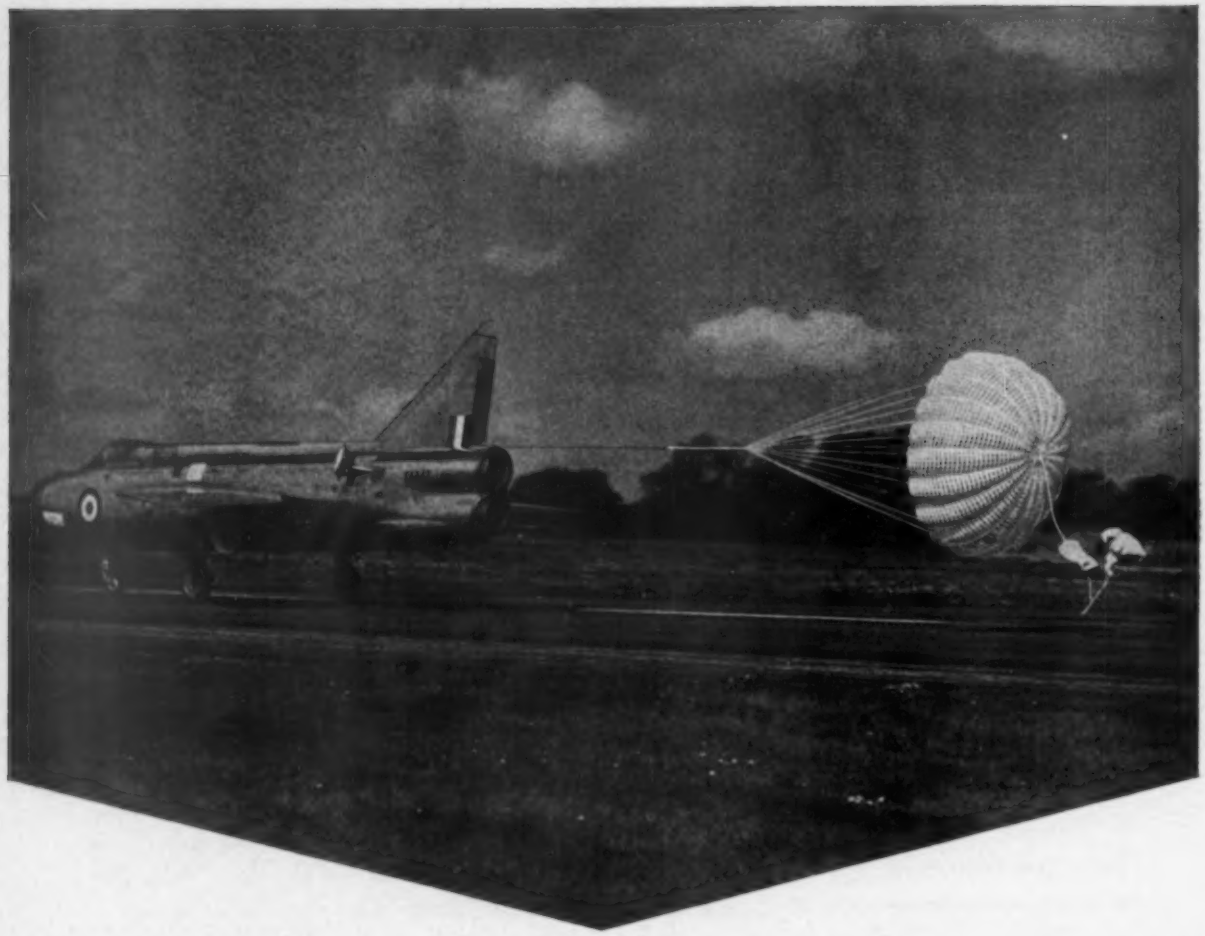

The characteristic short landing-run of the English Electric P.1—Britain's new all-weather, supersonic day and night fighter—is achieved with the aid of landing-brake parachute type LB.2 Mk 1, developed in conjunction with the Aircraft Division of The English Electric Company and designed and manufactured by

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Pride of the Nipponese fleet: a DC-7C of Japan Air Lines. Four DC-8s are on order.

WORLD AIRLINE DIRECTORY...

I.A.C. is responsible for all Indian internal services but Air-India International flies a few such services as part of its international network. Most of the A.I.I. revenue from internal sectors is passed to Indian Airlines.
Head Office: New Delhi, India.
Executives: S. Prasad, chairman; Y. N. Varma, secretary; J. S. Parakh, financial controller; Capt. J. Chitambar, chief operations and training manager; J. M. Gupta, chief traffic manager.
Fleet: six DC-4, 13 Viking, 65 DC-3, eight Heron, 10 Viscounts (being delivered).

Iranian Airways (Iranair) was founded as a private company in 1944 and began full scale scheduled operations in May 1946. Operations have steadily increased and Iranair's routes now extend across eight Middle East countries. Fifteen cities are served in Iran and the airline flies regular services to Pakistan, Afghanistan, Iraq, Kuwait, Syria and Lebanon. Iranair is managed under contract by Transocean Air Lines.
Head Office: Teheran, Iran.
Executives: Reza Afshar, chairman and managing director; Allan Barrie, general manager; Walter Kyse, operations manager; Leo Nikkari, controller; George Pohle, general traffic manager; Robert Martin, general sales manager; Ahmad Majidi, commercial manager; Gordon Linscheid, superintendent of maintenance.
Fleet: two Convair 240, six DC-3, two DC-4, eight Dove, four D.H.89, one Beechcraft. On order: three Viscount 700.

Iraqi Airways was founded in 1945 as a subsidiary of the Government-owned Iraqi State Railways. B.O.A.C. supplies certain technical staff as required. Viscounts operate frequent services from Baghdad to Basra, Beirut, Damascus, Cairo, and Teheran, and a twice weekly service to London via Istanbul and Vienna, and to Athens, Rome and Frankfurt. Vikings will continue to be used on services to Bahrain and Kuwait until improvements are made to Kuwait Airport. Services to Mosul and Aleppo are also flown by Vikings.
Head Office: Baghdad, Iraq.
Executives: Kana'an el Askari, manager; T. D. Walters, technical adviser; C. H. Robinson, chief engineer.
Fleet: three Viscount, three Viking, one Dove. On order: one Viscount 842.

Jamair—see Kalinga Airways.

Japan Air Lines Co., Ltd. (Nihon Koku Kabushiki Kaisha), is successor to the Japan Air Lines which was founded by private interests in 1951. That company opened domestic services with Martin 2-0-2s and DC-4s which, together with crews, were leased from Northwest Airlines. On October 1, 1953, the new company came into being with the Government holding 50 per cent of the stock. The old J.A.L. routes were taken over and routes were also opened to Hong Kong, Okinawa, Honolulu and San Francisco.
Head Office: Tokyo, Japan.
Executives: S. Yanagita, president; K. Ishikawa, vice-president; S. Matsuo, managing director.
Fleet: six DC-6B, four DC-7C, nine DC-4, three Heron, one Beech D.185. On order: four DC-8 (1960).

Japan Helicopter and Aeroplane Transport Co., Ltd.—see All Nippon Airways.

Jugoslovenski Aerotransport — JAT was founded in 1946 and is now the sole Jugoslav airline; it is completely state-owned. Domestic services are operated as well as routes to Athens, Cairo, Frankfurt, Istanbul, Munich, Paris, Vienna and Zurich.
Head Office: Belgrade, Jugoslavia.
Executives: M. Simovic, general manager; M. Rakic, traffic director; R. Radojevic, finance director; R. Radojkovic, technical director.
Fleet: 13 DC-3, one Convair 340, two Convair 440, six Ilyushin 14, two DC-6.

Kalinga Airways was formed in December 1957 by the merger of five leading Indian independent airlines (Assam Airways, Indamer Airways, Jamair, Kalinga Airways and Darbhanga Aviation). Kalinga plans to start scheduled services from India to Tibet this summer.
Fleet: 15 DC-3.

Kar-Air O/Y (Karhumäki Airways) is the airline operating offshoot of the long-established Finnish aircraft manufacturing, maintenance and charter organization. Scheduled operations were begun in 1950 between Helsinki and Joensuu, using two D.H.89s bought from Finnish Air Lines. In the following year further internal routes were operated as well as one to Sundsvall in Sweden and Lodestars were then used. The company's present routes are from Helsinki to Tampere; Helsinki to Joensuu; and between Tampere and Stockholm.
Head Office: Helsinki, Finland.
Executives: U. Karhumäki, president; M. Palmujoki, traffic manager; T. Karhumäki, technical manager.
Fleet: three DC-3, one Lodestar, two Convair 440.

Kita Nihon K.K.—see North Japan Airways.

K.L.M.—see Koninklijke Luchtvaart Maatschappij.

K.N.A.—see Korean National Airlines.

Koninklijke Luchtvaart Maatschappij N.V. (K.L.M.), the Dutch national airline, began operations in May 1920. A European network was established, and services to Java began in 1929. Services were begun in the West Indies in 1935 and these continued throughout the war, so the company can claim 37 years of continuous operation.

With a present unduplicated route mileage of over 140,000 miles, K.L.M. has a network of European routes, a West Indies network, and routes between Europe and North, Central and South America; South Africa; the Near, Middle and Far East; and Australia. For more than 30 years K.L.M. was directed by its founder, the late Dr. Albert Plesman. The majority of the company's capital is held by the Netherlands Government.
Head Office: The Hague, Holland.
Executives: I. A. Aler, president; M. J. van der Ploeg, deputy president; F. Besançon, L. H. Slotemaker, J. van der Wiel, executive vice-presidents.
Fleet: 10 L-749, 17 L-1049, 10 DC-7C, six DC-6, one DC-6A, seven DC-6B, five DC-4, nine Viscounts, 14 Convair 340, two Convair 240, 14 DC-3 (three chartered to "De Kroonduif"). On order: two DC-7C (1958) three L.1049H (1958), two Fokker Friendship (1959/60), eight DC-8 (1960), 12 Electra (1959/60).

Korean National Airlines was founded under the Ministry of Transport in 1947, and operated routes radiating from Seoul with Stinson Voyagers. DC-3s were introduced in 1950 shortly before the Korean war stopped commercial operations, which were resumed in 1952. The company now operates DC-3 services within South Korea and a DC-4 service between Seoul and Hong Kong. The company plans to open a Korea-U.S.A. route via Honolulu.
Head Office: Seoul, South Korea.
Executives: Y. W. Shinn, president; M. Kirk, managing director; S. Kim, acting traffic and sales manager; M. McCormick, chief engineer.
Fleet: one DC-4 and three DC-3.

Kuwait Airways, Ltd., was founded in 1953 as Kuwait National Airways, the present name having been adopted in 1955. Services are operated to Bahrein, Abadan, Basra, Jerusalem and Beirut. The company has a management contract with British International Airlines, a B.O.A.C. subsidiary in Kuwait.
Head Office: Kuwait.
Executives: A. S. Alkhaled, chairman; A. R. Mishri, manager; L. C. Giles, resident adviser.
Fleet: two DC-3.

L.A.B.—see Lloyd Aereo Bolivano.

L.A.C.—see Lloyd Aereo Colombiano.

LACSA—see Lineas Aereas Costarricenses, S.A.

LADE—see Lineas Aereas del Estado.

A bright day at Schiphol (Amsterdam), with the apron occupied by K.L.M.—an L.749, a DC-4 and three CV-440s.

Old stagers at Stockholm: two Lodestars and three DC-3s of Linjeflyg, A.B.

WORLD AIRLINE DIRECTORY...

L.A.I.—see Linee Aeree Italiane S.p.A. and Alitalia.

Lake Central Airlines, Inc., was founded in May 1949 as Turner Airlines to take over and operate the feeder services awarded to, but not implemented by, Roscoe Turner Aeronautical Corporation in 1947. Lake Central began services in November 1949 and works 1,500 miles of routes in the states between and to the south of Lakes Erie and Michigan. In 1955 employees of the airline bought the company's stock.
Head Office: Indianapolis, Indiana, U.S.A.
Executives: J. J. O'Connell, chairman; G. Hicks, president; L. W. Hartman, executive vice-president/treasurer; R. W. Clifford, vice-president operations.
Fleet: 10 DC-3.

Lake Air Taxi Service, Inc., operates scheduled services between Chicago and Michigan City and Benton Harbour.
Head Office: Chicago, Illinois, U.S.A.
Executive: W. Barnett, president.
Fleet: Piper Apache, Twin Beech.

L.A.N.—see Linea Aerea Nacional de Chile.

LANICA—see Lineas Aereas de Nicaragua, S.A.

Laurentian Air Services, Ltd., was founded in 1936 and now operates charter flights and a regular service from Ottawa to St. Jovite, Quebec.
Head Office: Ottawa, Ont., Canada.
Executive: A. B. Maclaren, president.
Fleet: six Beaver, one Cessna, one Goose.

L.A.V.—see Linea Aeropostal Venezolana.

Leavens Bros., Ltd., which operates passenger services between Windsor, Ontario, and Pelée Island in Lake Erie was originally formed in 1927. It was incorporated as Leaven Bros. Air Services in 1935 and was reorganized under its present name in 1953.
Head Office: Toronto, Ontario, Canada.
Executives: C. R. Leavens, president and general manager; R. H. Leavens, vice-president; C. D. Leavens, secretary; R. O. Brown, treasurer.
Fleet: two Cessna Crane.

Lebanese International Airways operates scheduled services between Beirut and Kuwait and charter flights. L.I.A. has recently been granted rights to operate to Paris.
Head Office: Beirut, Lebanon.
Executives: A. Arida, president.
Fleet: two C-46.

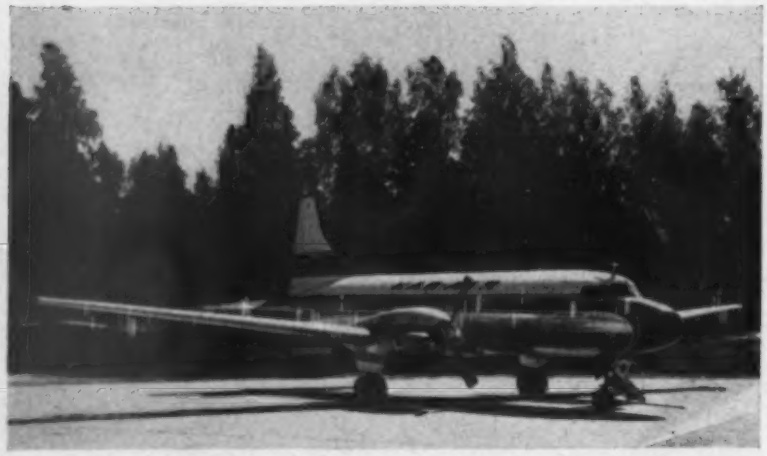
Leeward Islands Air Transport Co. operates low frequency services connecting Antigua with Montserrat, St. Kitts, Anguilla and San Juan, Puerto Rico.
Head Office: St. John's, Antigua, B.W.I.
Executives: Sir E. Dos Santos, director; U. Meade, secretary.
Fleet: two Piper Apache.

L.I.A.T.—see Leeward Islands Air Transport Services, Ltd.

Liberian National Airways is a Government-owned airline which began operations in 1952. Internal services are operated from Robertsfield and Monrovia to eight other points.
Head Office: Robertsfield, Liberia.
Executives: F. H. Syphert, president.
Fleet: two DC-3.

Lineas Aereas del Estado—LADE, was founded in September 1940 as a branch of the Argentine Air Force to operate services to isolated areas, and which could not be worked as commercial undertakings. After the war these services were taken over by commercial airlines but LADE is again flying certain domestic services.
Head Office: Buenos Aires, Argentina.
Executives: Brig. Gen. H. Rivara, director; J. F. Badin, general manager; D. Petronio, traffic manager.
Fleet: Viking, DC-3, DC-4.

One of the two CV-440s of Kar-Air O/Y.



Linea Aerea Nacional de Chile—L.A.N. was founded in 1932 by the Chilean Government to take over Linea Aeropostal Santiago Arica. The original fleet consisted of three Ford Trimotors. The company has developed services throughout the length of Chile and international routes to Mendoza, Buenos Aires and Rio Grande in the Argentine; La Paz in Bolivia; Lima and Tacna in Peru and Montevideo in Uruguay.
Head Office: Santiago, Chile.
Executives: A. Fernandez, president; E. Silva, secretary general; H. M. Sauvageot, business manager; R. S. Stone, vice-president operations.
Fleet: three DC-6B, four Martin 2-0-2, 18 DC-3, two Electra.

Linea Aerea TACA de Venezuela, C.A. Founded in 1944 by TACA Airways S.A. and Venezuelan interests. Local services were opened in 1945 and in 1950 TACA Airways disposed of its interest in the company. Two years later L.A.V. acquired outstanding stock and the airline is now a wholly owned L.A.V. subsidiary operated as a separate division. Services operated are all domestic with the exception of the routes from Caracas and Maracaibo to Bogota in Colombia.
Head Office: Caracas, Venezuela.
Executives: Col. L. Calderon, president; L. Paúl, general manager.
Fleet: 13 DC-3.

Lineas Aereas Costarricenses S.A. "LACSA," was founded in 1945 by Pan American Airways, the Government of Costa Rica and Costa Rican private interests. P.A.A. originally held 36 per cent of the stock but is believed now to hold a smaller percentage. Scheduled operations began in 1946. In 1952 LACSA took over TACA de Costa Rica, which had operated since 1939 as one of the units of the TACA system. LACSA operates a network of internal services based on San José and also routes to Panama, Puerto Rico, El Salvador, Mexico, Cayman Islands, Cuba and Miami.
Head Office: San José, Costa Rica.
Executives: F. Terán, president; R. E. Smith, general manager; F. Bonilla, asst. general manager; C. Holst, operations manager and chief pilot.
Fleet: three DC-3, four C-46, two Convair 340.

Lineas Aereas de Nicaragua, S.A.—LANICA, was founded in June 1945 with Pan American Airways holding 40 per cent of the company's capital. Internal services were begun in 1946 with a fleet consisting of two Boeing 247 aircraft. At present the company serves nine points in Nicaragua in addition to its home city, Managua.
Head Office: Managua, Nicaragua.
Executives: Col. L. A. Somoza, president; A. Sacasa, vice-president; F. P. Powers, vice-president; F. Gaitán, treasurer; C. A. Tellería, secretary.
Fleet: six DC-3, two C-46, one Ryan Navion, one Beech.

Lineas Aereas Espanolas—see Compania Mercantil Anonime Iberia.

Linee Aeree Italiane, S.p.A. LAI, was formed in 1946 with Italian interests holding 60 per cent of the stock and T.W.A. 40 per cent. The first routes, from Rome to Milan, Palermo and Cagliari, were opened in April 1947. In 1952 LAI absorbed Ali Flotte Riunite thus reducing the number of post-war Italian airlines to two. Transatlantic services were

inaugurated in July 1950. In 1957 LAI was merged into Alitalia (see). At the time of the merger LAI's system included domestic and European operations and routes to Boston, New York, Tel Aviv and Teheran.
Head Office: Rome, Italy.
Executives: In process of re-organization.
Fleet: two DC-6B, three DC-6, 13 DC-3, 10 Viscount 785, four L.1649A.

Linee Aeree Italiane, S.p.A.—see Alitalia.

Linea Aeropostal Venezolana—LAV was founded in 1933 when the Venezuelan Government took over the routes and equipment of the Cie. Gle. Aéropostale which had begun operating in Venezuela in 1930. LAV began flying with Latécoère 28 monoplanes and the first new type to be introduced was the Electra. LAV, which took over TACA de Venezuela in 1952, now has more than 10,000 miles of routes in Madrid, Miami, New York, Panama, Rome and Trinidad. Taca de Venezuela still operates as a separate company.
Head Office: Caracas, Venezuela.
Executive: Col. L. Calderon, president.
Fleet: three Viscount, four L.1049G, one L.1049C, two L.749, 18 DC-3, two Martin 2-0-2, four C-46, one Lodestar.

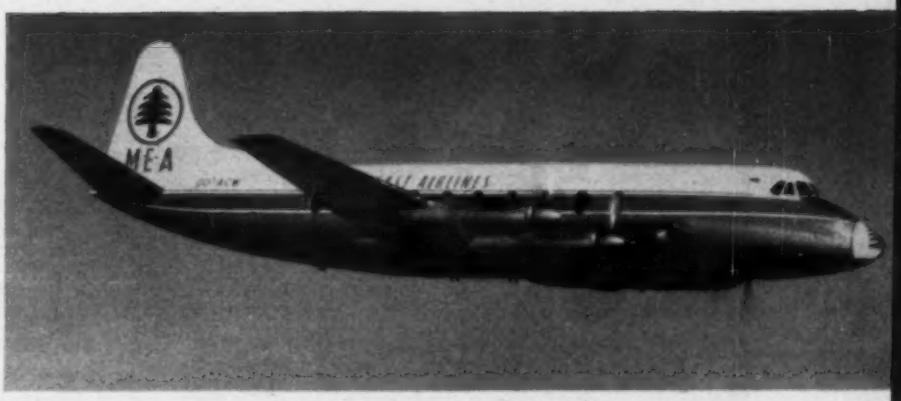
Linjeflyg A.B. was founded in 1934 as A. B. Bjorkvallsflyg and in 1944 became Skandinaviska Aero A.B. (Scandinavian Airways, Ltd.). Later S.A.S. paid the company about £10,000 to change its name to Airtaco. The present title was taken in 1957. Newspaper services are flown from Stockholm to Sundsvall/Härnösand, Karlstad, Trollhättan, Gothenburg, Alvesta, Malmö and other Swedish destinations and the company is allowed to carry passengers to Stockholm on the return flights from some of the points served. Charter and ambulance work is also undertaken. Linjeflyg is jointly owned by S.A.S. and two leading Swedish newspapers.
Head Office: Stockholm, Sweden.
Executives: C.-H. Hölifors, managing director; T. Andersson, flight superintendent; A. Ericsson, traffic and sales manager.
Fleet: nine DC-3, four Lodestar.

Lloyd Aéro Boliviano S.A.—L.A.B. was founded by German colonists on September 14, 1925, and opened in that year a route between Cochabamba and Santa Cruz. Junkers F13s were used on these first services. The company was taken over as the Bolivian national airline in 1941 and Panagra was given a contract to administer the airline. The government of Bolivia now holds 50 per cent of the stock of L.A.B.
The airline operates a network of domestic services and also routes to Arica in Chile, and Salta, Argentina.
Head Office: Cochabamba, Bolivia.
Executives: Edmundo Gonzalez, president; Rodolfo Galindo, general manager.
Fleet: 10 DC-3, two DC-4, six Boeing B-17.

Lloyd Aereo Colombiano. L.A.C. is a small company operating internally within Colombia. In 1956 an order was placed for three Viscounts, but delivery was never taken (one of these three aircraft was subsequently purchased by LANICA). L.A.C. is reported to be currently in the process of liquidation.
Head Office: Bogota, Colombia.
Fleet: DC-3, Cessna 310.

Loftleidir, formed in 1944, has operated services within Iceland and between Iceland and other European destinations, but now confines its activities to the operation of North Atlantic services between New York and Scandinavia, Germany and Luxembourg via Iceland.
Fares are substantially below I.A.T.A. rates, although the sectors east of Iceland have I.A.T.A.-agreed fares. Braathens S.A.F.E. Airtransport of Norway works closely with the Icelandic company.
In spring 1958 Loftleidir's capital was doubled (from two to four million kroner).
Head Office: Reykjavik, Iceland.
Executives: K. Gudlaugsson, chairman; A. Eliasson, general manager.
Fleet: three DC-4 (including one leased from another airline). On order: two Electra.

Loide Aéreo Nacional S.A. was established in its present form in 1951 by amalgamation with Lineas Aereas Paulistas and Transportes Aereos Bandeirantes. Nearly 10,000 miles of route are operated within Brazil, many second-class services being flown.



Emblazoned with the cedar tree of Lebanon is OD-ACW, one of Middle East's seven Viscount 732s.

Head Office: Rio de Janeiro, Brazil.
Executives: Col. M. G. Jacques, president; Ildeu Pereira, general and operations manager.
Fleet: 26 Curtiss C-46. On order: four DC-6.

Los Angeles Airways, Inc., was incorporated on May 11, 1944. The company began a mail service circuit in the San Fernando Valley on October 1, 1947, and thereby became the first scheduled service helicopter operator. Two further circuits were opened, one on October 15 and the other on January 8, 1948. A shuttle service was also established between the Los Angeles post office roof and the International Airport. Passenger services were inaugurated in November 1954 and these services now link 11 points with Los Angeles International Airport—S-55s are used on these services and the S-51s operate the mail flights. Route mileage 296.
Head Office: Los Angeles, Cal., U.S.A.
Executives: C. M. Belinn, president; M. J. Burke, secretary; J. T. Kane, treasurer; R. L. Bromberger, flight operations manager.
Fleet: five S-55, two S-51.

LOT—see Polskie Linie Lotnicze.

Lufthansa—see Deutsche Lufthansa A.G.

Mackey Airlines, Inc., now operating scheduled passenger services from St. Petersburg, Miami, Tampa, Fort Lauderdale and West Palm Beach to Nassau in the Bahamas, was incorporated as Mackey Air Transport in 1946. Scheduled operations were approved in 1952 and inaugurated on January 2, 1953. Applications have been filed for routes to Havana and other places in the Caribbean area.
Head Office: Fort Lauderdale, Florida, U.S.A.
Executives: J. C. Mackey, president; L. J. Povey, vice-president; J. H. Popham, secretary; H. H. Johnson, traffic manager.
Fleet: four DC-3, two DC-4, two Goose. On order: two Fokker Friendship (delivery, spring 1958).

MacRobertson Miller Airlines, Ltd., was brought into being in 1955 by the merger of MacRobertson-Miller Aviation Co. (Pty.), Ltd., and Airlines (W.A.), Ltd. MacRobertson-Miller Aviation was founded in 1927 and was successor to the Commercial Aviation Co., founded by Capt. H. C. Miller shortly after the first war. Airlines (W.A.) was established in 1935 and the two companies had extensive experience in the operation of airlines throughout the length of the west coast of Australia and the allied inland districts. It is over this entire area that M.M.A. operates scheduled services.
Head Office: Perth, Western Australia.
Executives: R. Rushton, chairman; C. N. Kleinig, managing director; H. C. Miller, regional director; J. W. Cameron, executive director; E. C. Gare, secretary; K. Cohen, operations manager.
Fleet: five DC-3, three Dove, three Anson.

Magyar Légiközlekedési Vállalat—MALEV was founded as Maszovlet (Hungarian - Soviet Air Traffic Company) in 1946. The U.S.S.R. withdrew its interest in 1954 and the present title was then adopted. The airline now operates an 1,850-mile network within Hungary and to Sofia, Berlin, Warsaw, Budapest, Prague, Bucharest, Vienna and Belgrade.
Head Office: Budapest, Hungary.
Fleet: Li-2.

Malayan Airways, Ltd., founded in 1947, has as its main shareholder Blue Funnel Line, Straits Steamship Co., and B.O.A.C. (with a minority interest). DC-3s operate from Singapore to points in Malaya and to Medan, Palembang, Bangkok, Sarawak and North Borneo. North Borneo - Brunei - Sarawak local services are operated with D.H.89s. Internal services operated by Federation Air Services from Kuala Lumpur were taken over in March 1958.
Head Office: Singapore.
Executives: F. L. Lane, chairman; R. P. Mollard, managing director; J. Skeldon, manager; A. G. Beohm, traffic manager; S. H. Edwards, engineer superintendent.
Fleet: 11 DC-3, three D.H.89.

MALEV—see Magyar Légiközlekedési Vállalat.

Malta Airlines, The. This concern is an associate of B.E.A. and consists of the Malta Airways Company, Ltd., and its wholly owned subsidiary Air Malta, Ltd. B.E.A. operates the routes of Malta Airlines between Malta and Italy, France, the United Kingdom, Corsica and Libya. The B.E.A. shareholding is 34 per cent.
Head Office: Valetta, Malta G.C.
Executive: Lt-Col. R. Strickland, chairman.
Fleet: B.E.A. aircraft supplied and operated by agreement.

Mandated Airlines, Ltd., was founded in 1936 as a subsidiary of W. R. Carpenter and Co., Ltd., the aviation assets of which were taken over by Qantas in 1934. Mandated became an independent company, and in 1937 the airline was awarded a contract for passenger, mail and cargo work in New Guinea. Mandated now operates scheduled services from Lae to eight points including Goroka, Wau, Port Moresby and Rabaul. Charter and other work is also undertaken.
Head Office: Lae, New Guinea.
Executives: J. B. Sedgers, managing director; C. Bailey, A. Anthony, G. Washington, J. I. Cromie, directors; H. J. Hindwood, manager; C. Brien, secretary.
Fleet: five DC-3, three D.H.84.

Maritime Central Airways, Ltd., is a private company which began regular service in 1941 between Charlottetown on Prince Edward Island and Moncton, New Brunswick. With its mixed fleet the company undertakes charter work and maintains regular services to New Glasgow, Halifax, the Magdalen Isles, Summerside, Moncton, St. John, Fredericton, Goose Bay, Gander and St. John.
Head Office: Charlottetown, Prince Edward Island, Canada.
Executives: F. T. Briggs, president; C. F. Burke, vice-president; W. F. Gaudet, personnel and traffic manager; A. M. Clark, secretary/treasurer; H. S. Jones, operations manager.
Fleet: seven DC-3, three DC-4, three C-46, one York, one Beaver, three Beech C-18S. On order: two DC-6B.

A pontoon-equipped Sikorsky S-55 of New York Airways, with the 30th-Street heliport in the foreground.

WORLD AIRLINE DIRECTORY...

Metane Air Services, Ltd., was founded in 1947 to operate charter services across the St. Lawrence from Matane. In 1952 regular services were opened from Matane to Franquelin Godbout, Trinity Bay, Pentecote and Shelter Bay. Since early 1957 the company has been the only carrier serving these points. The company has recently been licensed to operate between Matane and Baie Comeau, and Matane and Las Ste. Anne.
Head Office: Matane, Quebec, Canada.
Executives: G. Burnett, president; J. G. Sirois, chief engineer; W. J. Anderson, chief pilot.
Fleet: four Lockheed 10A Electra, one Cessna Crane.

Mercury International Company Airlines, was operating local services between San Bernardino and Los Angeles, Riverside, Big Bear Lake and Victorville. There is no recent news of this company.
Head Office: San Bernardino, Cal., U.S.A.
Fleet: Cessna 195, Beech Bonanza.

Meteor Air Transport, Inc., a large irregular carrier, carries out frequent charter flights for the U.S. military services.
Head Office: Teterboro, N.J., U.S.A.
Executive: O. L. Morrow, president.
Fleet: two DC-4, two C-46.

Mexicana—see Compania Mexicana de Aviacion, S.A.

Middle East Airlines Co. S.A.—MEA, was founded as a private concern in 1945. In 1949 Pan American Airways acquired 36 per cent of MEA's stock but the company has now withdrawn and B.O.A.C., through A.B.A.(M.E.), holds 48 per cent of the stock. Services are operated throughout the Middle East and to Ankara, Athens, Istanbul, Rome, Vienna, Paris, Frankfurt and London.
Head Office: Beirut, Lebanon.
Executives: Sheikh Najib Alamuddin, chairman/managing director; Col. Cyril Easely, general manager; E. C. Terleske, financial comptroller; Salim Salaam, asst. G.M. sales; Assad Y. Nasr, asst. G.M. planning and administration; Capt. R. Hornall, asst. G.M. operations.
Fleet: seven Viscount 754, four DC-3, one Bristol 170, three York.

Minhaiduy, Civil Aviation Administration of China, is successor to Skoga, which was formed in 1952 as a joint Soviet-Chinese undertaking. In 1954 Soviet Participation was withdrawn. Minhaiduy now operates a large domestic network and international services to Irkutsk (as part of the Peking - Moscow route), Rangoon, and Hanoi.
Head Office: Peking, China.
Fleet: Il-14, Il-12, Li-2.

Misrair S.A.E. — Egyptian Airlines was founded as Misr Airwork in 1932. The present name was taken in 1949 and all the capital is now Egyptian-owned. Scheduled services were begun in 1933 and the company now operates an extensive network of services in the Middle East and to Europe. A merger is at present being discussed with Syrian Airways.
Head Office: Cairo, Egypt.
Executives: M. S. Mahmoud, chairman; M. S. El Miligi, general manager; A. O. Mokbel, deputy general manager (administration); M. F. Raafat, deputy general manager (commercial); H. Tewfik, deputy general manager (technical).
Fleet: two Viscount 739, seven Viking, one Beech D.18S, two DC-3. On order: two Viscount.

M.M.A.—see MacRobertson Miller Airlines, Ltd.

Mohawk Airlines, Inc., was founded in 1945 as an intra-state carrier with the title Robinson Airlines. The company took its present name in 1952 and is now operating about 1,600 miles of routes in New York, New Jersey, New England, Pennsylvania and Michigan. During 1954 Mohawk operated helicopter services between Newark and Liberty/Monticello. An S-55 was used but this venture was short-lived.
Head Office: Oneida County Airport, Utica, N.Y., U.S.A.
Executives: E. Victor Underwood, chairman; R. E. Peach, president; J. R. Carver, vice-president/gen. counsel; C. A. Benscoter, vice-president operations; Bruce C. McLean, secretary.
Fleet: 11 DC-3 (including one leased out), 11 Convair 240, one Beech.

NAB—see Navegacao Aerea Brasileira.

Nacional Transportes Aereos, S.A.—see REAL S.A. Transportes Aereos.

National Airlines, Inc., known as *Airline of the Stars,* was founded as National Airlines System in October 1934 as a regional operator with a 142 mile route between St. Petersburg and Daytona Beach. The airline now operates a network extending from New York and Washington down the eastern seaboard to Tampa and Miami. Routes from Jacksonville and Tampa stretch west to New Orleans, and Havana is served by routes from New York, Tampa and Miami. Throughplane services link New Orleans with California.
Head Office: Miami, Florida, U.S.A.
Executives: G. T. Baker, president; J. C. Brawner, vice-president/treasurer; R. P. Foreman, secretary; L. W. Dymond, asst. vice-president operations; W. A. Perry, vice-president/general sales manager; H. K. Pike, asst. vice-president maintenance and engineering.
Fleet: nine Lodestar, 12 Convair 340, four DC-6, eight DC-6B, three DC-7, six Convair 440, four DC-7B, four L.1049H. On order: 23 Electra (1960-61), six DC-8 (1959-60).

National Greek Airlines—see Olympic Airways.

Navegacao Aerea Brasileira, N.A.B., was established in 1939 and began operations in 1941 over a coastal route linking Rio de Janeiro and Fortaleza. In 1948, when the route mileage had reached nearly 5,000, financial difficulties caused the suspension of operations. The company began work again in 1951 and at present NAB serves a coastal route from Rio to Vitoria, and an inland route to Belo Horizonte.
Head Office: Rio de Janeiro, Brazil.
Executives: Dr. M. Barbosa, president; R. Portela, technical manager; G. de Oliveira, business manager.
Fleet: DC-3.

Nederlands Luchtrechambedryf carries out chartered passenger and cargo flights in addition to work on reclamation projects.
Head Office: Rotterdam, Netherlands.
Executive: M. Schroder.
Fleet: one Marathon.

Nederlands Nieuw Guinea Luchtvaartmaatschappij "De Kroonduif" N.V., is a new company operating local services based on Biak. "De Kroonduif" is managed by K.L.M. from which company its DC-3s are chartered. This

New Zealand National Airways still have D.H.89 Rapides on scheduled services.

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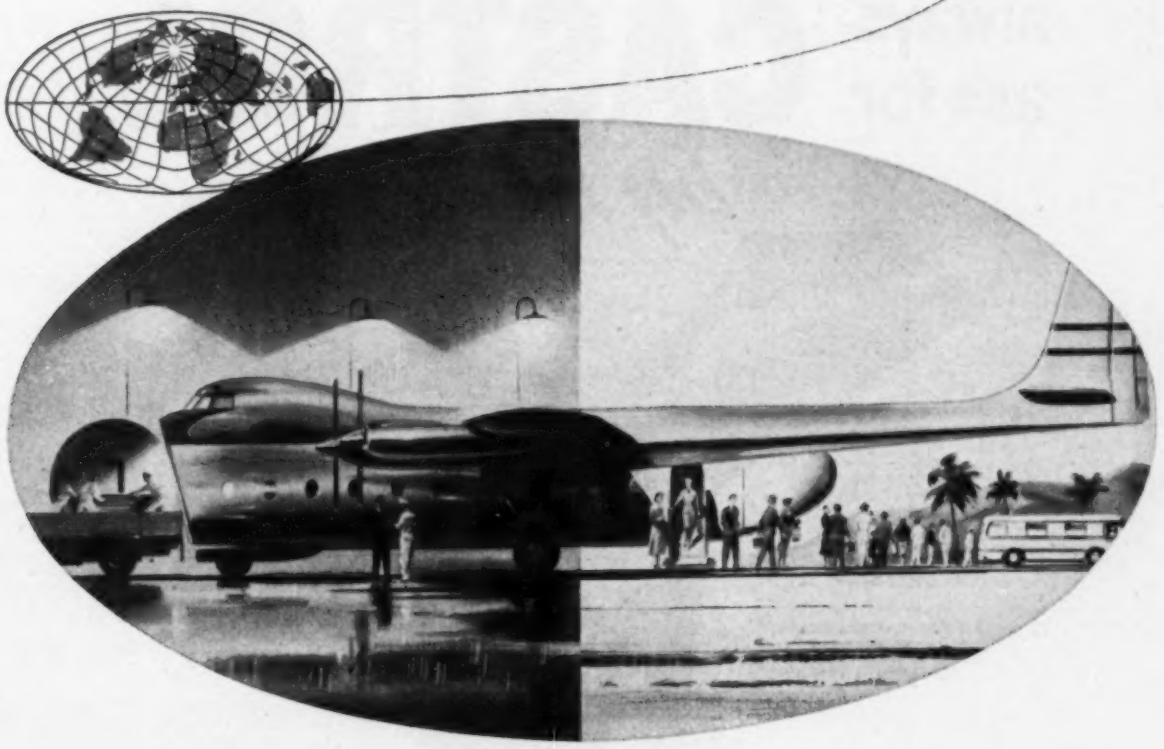

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WORLD AIRLINE DIRECTORY...

airline was the first to confirm an order for Scottish Aviation Twin Pioneers.
Head Office: The Hague, Holland.
Executives: managed by K.L.M.
Fleet: three DC-3 (chartered from K.L.M.), four Beaver, two Twin Pioneer.

New York Airways, Inc., was formed in 1949 with the object of operating scheduled helicopter services in the New York area. Mail operations between the New York airports were inaugurated on October 15, 1952. Mail services were subsequently opened to suburban areas, and passenger services linking New York International, La Guardia and Newark airports began on July 8, 1953. In addition to its airport links the company now serves the New York area, New Jersey and Connecticut. Regular service to and from Manhattan began on December 5, 1956. This company is in the process of converting to an all Vertol 44 fleet.
Head Office: La Guardia Airport, New York.
Executives: R. L. Cummings, Jnr., president; H. Brock, vice-president; W. W. Hogan, treasurer; John H. Slate, secretary.
Fleet: three Sikorsky S-58, five S-55, one Bell 47H. On order: five Vertol 44.

New Zealand National Airways Corporation —NAC. This company was founded by Act of Parliament in 1945 to take over and expand the operations of Air Travel (N.Z.), Ltd., Cook Strait Airways, Ltd., and Union Airways of New Zealand, Ltd. Following the change of Government in 1949 an attempt was made to sell NAC but this was not successful. NAC operates over 3,679 miles of routes in and between North and South Islands.
Head Office: Wellington, C.I., New Zealand.
Executives: Sir Leonard Isitt, chairman; J. S. Hunter, deputy chairman; J. J. Busch, general manager; H. C. Walker, operations manager; W. J. Jennings, commercial manager; C. W. Labette, engineering superintendent.
Fleet: 25 DC-3, four Heron, two D.H.89, three Viscount 807 (current delivery).

North Central Airlines, Inc., was founded in 1944 as Wisconsin Central Airlines. Approval for the operations of routes from Chicago to cities in Wisconsin, eastern Minnesota and Upper Michigan was given in 1946 and operations were begun with Lockheed Electras in February 1948. The company adopted its present name at the end of 1952, now operates 3,471 miles of routes in the Great Lakes area, and is the largest U.S. local service carrier.
Head Office: Minneapolis, Minnesota, U.S.A.
Executives: H. N. Carr, president; B. Sweet, secretary/treasurer; F. N. Buttomer, vice-president traffic and sales; A. D. Niemeyer, vice-president operations; R. H. Benido, vice-president maintenance and engineering; A. E. Schwandt, vice-president industrial relations.
Fleet: 26 DC-3.

Northeast Airlines now serves the New England area and has routes extending from Montreal through Boston, New York, and Washington to Florida. The company was founded by the Boston and Maine and Maine Central Railroads as Boston-Maine Airways, and services were begun between Boston and Waterville on August 11, 1933. The present name was taken in 1940. In 1956 Northeast was awarded rights to operate from New York to Miami.
Head Office: Boston, Mass., U.S.A.
Executives: George E. Gardner, president; D. W. H. MacKinnon, vice-pres. engineering and maintenance; A. A. Lane, vice-pres. operations; H. Heard, vice-president finance; R. H. Keer, vice-pres. personnel.
Fleet: 11 DC-3, six Convair 240, 10 DC-6B. On order: five Britannia (summer 1958).

Northern Consolidated Airlines, Inc., was founded in 1945 to integrate the operations of a number of small airlines in southwest Alaska. The company now has about 3,000 miles of routes worked by scheduled and non-scheduled flights.
Head Office: Anchorage, Alaska.
Executives: R. I. Petersen, president/general manager; S. B. Fitzhugh, vice-president/treasurer; V. R. Davis, secretary/general traffic manager; W. R. Rice, operations manager; L. P. Fritz, general sales manager.
Fleet: four DC-3, 10 Cessna T-50. On order: three Friendship (1958/59).

Northern Wings, Ltd.—Les Ailes du Nord Ltée, flies non-scheduled services and is believed to operate a scheduled route of about 400 miles from Seven Islands to Blanc Sablon on the Quebec/Labrador border.
Head Office: Quebec, P.Q., Canada.
Executives: Dr. G. Cyr, president; H. Beaupré, secretary; J. L. Roy, controller; T. Coghlan general manager.
Fleet: two DC-3, two Canso, three Norseman, four Beaver, one Beech 17, one Anson V.

North Japan Koko K.K. has recently inaugurated a limited domestic network.
Fleet: three Cessna, one DC-3.

Northwest Airlines, Inc., was incorporated on August 1, 1926, as Northwest Airways and mail services were begun between Minneapolis/St. Paul and Chicago on October 1 that year, using a leased Curtiss Oriole and a Thomas Morse. The company's first owned fleet consisted of three Stinson Detroiters purchased in 1926 and the first passenger services were opened in July 1927.

The present corporate name was adopted in 1934. For publicity purposes the airline trades as Northwest Orient Airlines. By 1945 a transcontinental route had been established and in 1947 the company began services to the Far East. In 1948 Washington and Honolulu were added to the network and in 1950 Edmonton and Formosa were added. The present system comprises 20,000 miles of routes stretching from coast to coast of the U.S.A.; into Canada and Alaska; to Hawaii; and across the Pacific to Japan, South Korea, Okinawa, Manila, Formosa and Hong Kong. In 1958 Northwest was given permission to extend its domestic network to Florida.
Head Office: St. Paul, Minnesota, U.S.A.
Executives: C. Hunter, chairman; D. W. Nytop, president; M. S. Mackay, executive vice-president; F. C. Judd, vice-president operations and engineering; G. M. Bain, vice-president sales; L. S. Holstad, comptroller; W. J. Eiden, treasurer.
Fleet: three DC-7C, four L.1049G, nine Stratocruiser, 16 DC-6B, 18 DC-4, five DC-3. On order: four DC-6B, 11 DC-7C.

One of Osterreichische Luftverkehrs' (Austrian Airlines) Viscount 779s—chartered from Fred Olsen—in its striking white and red livery.

Okanagan Helicopters, Ltd., was founded in 1947 by Carl Agar to conduct fruit-spraying by helicopter. Development of mechanical sprayers necessitated a switch of emphasis to other activities. Two important operations today are provision of transport for Alcan's construction scheme at Kilimat and patrol of oil pipelines. In 1955 Okanagan expanded by acquiring Kentine Aviation's fleet of 16 Bell 47s and seven S-55s and by acquiring Canadian Helicopters, Ltd. A subsidiary, United Helicopters, Ltd., is based at Torbay, Newfoundland, and operates two S-55s on charter. Together with its associated companies, Okanagan is the world's largest operator of helicopters. The Abitibi Power and Paper Co., through Canadian Helicopters, is believed to have a substantial share in this company.
Head Office: Vancouver, B.C., Canada.
Executives: G. W. McPherson, president; Carl Agar, vice-president research/training; A. Stringer, vice-president operations.
Fleet: 36 Bell 47, 20 S-55, one S-58.

Olsen Air Transport—see Fred Olsen Airtransport, Ltd.

Olympic Airways took over the assets of T.A.E., National Greek Airlines, in April 1957. T.A.E. was founded in July 1951 by the amalgamation of T.A.E., Hellenic Airlines and the smaller A.M.E. Following financial difficulties the company was taken over by the Greek Government in June 1955. Olympic Airways are owned by Mr. A. Onassis. Olympic operates domestic services and to Turkey, Cyprus, Israel, Egypt, Lebanon, Italy, France and the United Kingdom.
Head Office: Athens, Greece.
Executives: A.V-M. N. Voyadiz, president; S. Damaskinos, commercial manager; J. Papaletsos, financial manager; C. Dannis, technical manager; G. Theodoropoulos, planning manager.
Fleet: one DC-4, 14 DC-3, one Fairchild Argus, one DC-6B. On order: three DC-6B, two DC-8.

Ostermans Aero A.B. was formed in 1943 and has since 1947 been operating helicopters. Most of the company's work is of a contract nature but every winter since 1948 Ostermans have operated regular mail service between Stockholm and numerous points in the Stockholm Archipelago. This service has been operated with very high standards of reliability and regularity. During 1955 the company operated S-55 services, for a short time, between Sweden and Denmark.
Head Office: Stockholm, Sweden.
Executives: N. Billing, managing president.
Fleet: two S-55, 12 Bell 47, one Djinn 1220, four Seabee, one Norseman.

Photographed at Seattle-Tacoma airport are a DC-4 and two L.749s of Pacific Northern Airlines—"the Alaska Flag Line."

Now flying regularly to London are the ex-Sabena CV-240s of Polskie Linie Lotnicze—LOT Polish Airlines.

WORLD AIRLINE DIRECTORY...

Osterreichische Luftverkehrs A.G., (Austrian Airlines), is the new Austrian airline founded in April 1956 by agreement between Air Austria and Austrian Airways, neither of which had begun operations. The capital of the new company is 60m Austrian schillings. Scandinavian Airlines System and Fred Olsen Airtransport each have 15 per cent interests in the new company. Operations, using Viscounts chartered from Olsen, started in March 1958.
Head Office: Vienna, Austria.
Executives: Not known.
Fleet: four Viscount.

Overseas National Airways, Inc., is one of the biggest large irregular carriers in the U.S. Its fleet carry out frequent trans-Pacific military charter flights.
Head Office: Oakland, California, U.S.A.
Executives: G. W. Tompkins, president; J. R. Forrest, vice-president/treasurer; F. C. Wright, vice-president operations.
Fleet: four DC-4, four DC-6A.

Ozark Air Lines, Inc., was incorporated under the laws of the State of Missouri on September 1, 1943, and filed applications for C.A.B. certificate to serve 28 cities in six states. Charter and intra-state services in Missouri operated during 1944 and 1945. Ozark was awarded a three-year certificate in 1950, took over the assets and staff of Parks Air Lines and began scheduled operations between St. Louis and Chicago on September 26, 1950.

The company now has permanent certification and operates 4,906 miles of routes serving 49 cities in nine Mid-West states.
Head Office: St. Louis, Missouri, U.S.A.
Executives: B. T. Mattingly, chairman; L. Hamilton, president; A. Blumeyer, vice-president; F. W. Jones, treasurer; A. G. Heyne, secretary.
Fleet: 20 DC-3.

P.A.B.—see Panair do Brasil.

Pacific Air Lines was founded as Southwest Airways Company in 1941 and began airline operations at the end of 1946 when it opened its San Francisco - Los Angeles route. The company now has 1,300 miles of routes all within California, except for its services to Medford in the south of Oregon. Southwest was a pioneer of the quick turn-round at intermediate points with stops of only one to two minutes. At refuelling stops the turn-round time is six minutes. The present title was adopted early in 1958.
Head Office: San Francisco, Cal., U.S.A.
Executives: L. Hayward, chairman; J. H. Connelly, president; T. R. Mitchell, executive vice-president; A. W. Johnson, vice-president/treasurer; R. B. Costello, vice-president traffic and sales.
Fleet: 11 DC-3, seven Martin 2-0-2. On order: three Friendship.

Pacific Northern Airlines, Inc., calls itself "The Alaska Flag Line" and came into being in 1932 as Woodley Airways. A post office mail contract was awarded in 1934 and in 1938 the airline received C.A.B. certification. The present company was incorporated in 1945 and in 1951 P.N.A. was granted a certificate by C.A.B. to connect its Alaskan routes with Seattle - Tacoma and Portland. Services are now operated within Alaska and between Alaskan points and Seattle and Portland.
Head Office: Seattle, Washington, U.S.A.
Executives: A. G. Woodley, president; J. A. Cunningham, vice-president operations; Harold A. Olsen, vice-president traffic and sales; J. H. Foster, vice-president engineering and maintenance.
Fleet: four L.749 Constellation, two DC-4, four DC-3, one L.14.

Pacific Southwest Airlines—PSA, operates services linking San Diego, Los Angeles and San Francisco.
Head Office: San Diego, Cal., U.S.A.
Executives: K. G. Friedkin, president; H. N. Wood, traffic and sales manager; J. F. Andrews, chief of operations.
Fleet: DC-4.

Pacific Western Airlines, Ltd.—PWA, was founded in 1946 as Central British Columbia Airways, and has become the third largest airline in Canada by acquisition of Associated Airways (and its subsidiary Associated Helicopter Airways) at Edmonton, and Queen Charlotte Airlines at Vancouver. The company operates an extensive network of scheduled and non-scheduled routes throughout British Columbia, Alberta, the Yukon, the Northwest Territories and Alaska. PWA has also been one of the prime contractors operating the extensive air lift in connection with defence projects in Canada's extreme north. PWA has applied to operate transcontinental scheduled services.
Head Office: Vancouver, B.C., Canada.
Executives: K. J. Springer, chairman; R. Baker, president; D. F. Granger, secretary/treasurer.
Fleet: six DC-3, two C-46, two Canso, two DC-4, two York, 12 Norseman, 23 Beaver, two Mallard, eight Cessna 180, 10 Bell 47.

P.A.D.—see Philippines Aviation Development.

Pakistan International Airlines Corporation was founded by the Government of Pakistan on April 1, 1955, when P.I.A. took over Orient Airways. As a company P.I.A. had been founded in 1951 to operate services to Europe; its first actual operations were between East and West Pakistan in 1954. Service to London was begun early in 1955. The Corporation is now responsible for the operation of all Pakistani air services.
Head Office: Karachi, Pakistan.
Executives: Z. Ahsan, general manager; M. M. Salim, chief administration officer; M. Haque, flight operations manager; J. S. Mirza, traffic and sales manager.
Fleet: three L.1049C, two L.1049H, four Convair 240, ten DC-3. On order: five Viscount 815.

P.A.L.—see Philippines Air Lines.

Panagra—see Pan American Grace Airways, Inc.

Panair do Brasil, S.A. In October 1929 the Brazilian Government authorized New York, Rio and Buenos Aires Line Inc. (NYRBA) to operate services in Brazil, and Nyrba do Brasil was created as a Brazilian subsidiary. A service was begun between Rio de Janeiro and Belem. In August 1930 Pan American Airways took over both NYRBA and Nyrba do Brasil and the latter became Panair do Brasil on September 15 that year. PAB developed services with Sikorsky S-38 and Consolidated Commodore flying-boats. These were later replaced by Fairchild 91s and Sikorsky S-43s and, although Panair now operates an extensive Brazilian and South American route network with DC-3s and Constellations, Catalinas still operate the Amazon routes. Panair operates services from South America to London, Hamburg, Frankfurt, Düsseldorf, Paris, Zürich, Rome, Madrid, Lisbon, Istanbul and Beirut.
Head Office: Rio de Janeiro, Brazil.
Executives: Dr. A. H. Machado, president; Dr. C. P. de Mello, dir. superintendent; Dr. A. T. Filho, secretary.
Fleet: 11 L.749, 14 DC-3, four DC-7C, five Convair PBY-5A.

Pan American-Grace Airways, Inc. (Panagra), was founded in 1929 by the Grace Shipping Line and Pan American Airways, each holding half the shares. In 1928 Pan American Airways was awarded a mail contract for a service from Florida to Panama, and in the following year Panagra successfully bid for a mail contract covering a route from Panama down the west coast of South America and across the Andes to Buenos Aires. By the end of 1929 the complete route was in operation. The company's routes have been gradually extended and after a long fight, much of it against Pan American, Panagra has succeeded in securing entry to New York through interchange agreements with P.A.A. and National

First of the "Big Jets" to bear an operator's livery: the first Boeing 707-120 for Pan American.

"Southern Aurora" is one of the sixteen "Super-G" Constellations used by Qantas Empire Airways.

Airlines. Operating over the routes of the three companies Panagra DC-7Bs were introduced on August 1, 1955, and under the title of El Inter Americano daily services are flown between New York and Buenos Aires via Miami, Panama, Lima and Santiago.
Head Office: New York, U.S.A.
Executives: A. B. Shea, president; D. Campbell, vice-pres./gen. mgr.; L. H. Clifton, vice-president/comptroller; C. S. Collins, vice-president traffic and sales.
Fleet: four DC-3, two DC-4, four DC-6 (leased to PanAm), four DC-6B owned, one DC-6B leased, five DC-7B (excludes one leased to another airline). On order: four DC-8.

Pan American World Airways, Inc., is the only major U.S. airline concerned entirely with overseas operation. Pan American Airways, Inc., was founded in March 1927 and began operation of its first route, between Key West and Havana, in October 1927. Fokker monoplanes were used. P.A.A. extended its operation throughout the Caribbean and built up flying-boat services, which by 1931 had reached the Argentine. P.A.A. was a great pioneer of transocean flying and by 1935 had established services between San Francisco and Manila via Honolulu, Midway, Wake and Guam. Hong Kong was served from 1936. In 1937 New York - Bermuda services were opened in co-operation with Imperial Airways and in the same year the two companies began trans-atlantic survey flights. Passenger service began in 1939. The airline now operates a route network of more than 60,000 miles, serves all continents and has regular round-the-world flights. Pan American took its present title in 1949. The airline has absorbed a number of other airlines including American Overseas Airlines and it has interests in numerous carriers, particularly in Latin America. P.A.A. has been a particularly strong advocate of cheap fares and mass air travel. Pan American is also operating the 1,000 mile long missile range, stretching from Florida to beyond Puerto Rico, for the U.S.A.F.
Head Office: New York, U.S.A.
Executives: J. T. Trippe, president; J. C. Leslie, vice-president administration; S. F. Pryor, vice-president/asst. to president; H. J. Friendly, vice-president/general counsel; W. L. Morrison, vice-president Latin American Division; H. E. Gray, vice-president Atlantic Division; C. M. Young, vice-president Pacific-Alaska Division.
Fleet: 24 Stratocruiser, 25 DC-7C, eight DC-7B, 41 DC-6B (excludes four leased to other airlines), three DC-6A, 26 DC-4, five L.49, five Convair 240, four DC-3, four DC-6 leased from Panagra. On order: 21 DC-8 (start 1959), six Boeing 707-120 (1958), 17 Boeing 707-320 (1958).

Peninsula Air Transport is a U.S. supplemental air carrier operating scheduled services on an irregular basis from Miami to St. Petersburg, Philadelphia, New York, Chicago, Detroit and Milwaukee.
Head Office: Miami, Florida, U.S.A.

Persian Air Services, in which Skyways of London is believed to have an interest, operates freight services from Teheran to Beirut, Abadan, Brindisi and Basle.
Head Office: Teheran, Iran.
Fleet: Avro York.

Philippine Air Lines—PAL, began in 1932 as the Philippine Aerial Taxi Company. The company was reorganized and took its present name in 1941. Following the war the company developed its operations, and in 1947 and 1948 PAL took over two other Philippine concerns—Far Eastern Air Transport and Commercial Air Lines. Long distance overseas services were inaugurated to Europe and across the Pacific to the U.S.A., but in 1954 PAL abandoned its long distance services and now operates only within the Philippine Republic and to Hong Kong although a resumption of long distances to the U.S. is being reconsidered.
Head Office: Manila, Republic of the Philippines.
Executives: A. Soriano, president; R. Yoga, vice-president/treasurer.
Fleet: 29 DC-3, three Convair 340, three Otter, two Hiller UH-12B, four Norseman. On order: two Viscount.

Philippine Aviation Development—P.A.D. is operated by the Government to provide certain internal services.
Head Office: Manila, Philippines.
Fleet: 11 single-engined aircraft.

P.I.A.—see Pakistan International Airlines.

Piedmont Airlines—see Piedmont Aviation, Inc.

Piedmont Aviation, Inc., was founded in 1940 as a fixed base operator and began local service operations in 1948. Trading as Piedmont Airlines the company now has about 2,800 miles of routes in North and South Carolina, Tennessee, Virginia and West Virginia, Kentucky and Ohio.
Head Office: Winston-Salem, North Carolina, U.S.A.
Executives: T. H. Davis, president/treasurer; R. D. Hager, vice-president traffic; H. K. Saunders, vice-president operations; M. F. Fare, secretary.
Fleet: 21 DC-3. On order: 12 F-27.

Pioneer Air Lines—see Continental Air Lines.

PLUNA—see Primeras Lineas Uruguayas de Navegacion Aerea.

Polskie Linie Lotnicze—LOT, was formed by the Government in 1929 to take over the operations of the private companies Aerolot and Aero of Poznan. By the start of the war LOT had established itself as a well-run airline with a modern fleet of Electras and Lockheed 14s. Part of this fleet was brought to England and served with B.O.A.C. The airline flies domestic services and also to Athens, Belgrade, Berlin, Brussels, Bucharest, Budapest, Copenhagen, Moscow, Paris, Prague, Sofia, Stockholm, Vienna, London and Vilno.
Head Office: Warsaw, Poland.
Executives: S. Minoraki, general director; M. Rolski, commercial director; W. Leja, technical director.
Fleet: Li-2, Il-14, Il-12.

Primeras Lineas Uruguayas de Navegacion Aerea—PLUNA, began operations as a private company in 1936 but in 1943 it was reorganized, with the Government taking a 49 per cent interest. The Government share later rose to 83 per cent and subsequently 94 per cent, before becoming completely Government-owned in 1951. Pluna operates domestic services and routes to the Argentine, Bolivia, Brazil and Paraguay.
Head Office: Montevideo, Uruguay.
Executives: Col. E. B. Vaeza, president; D. D. Cibils, general manager; R. Langon, assistant general manager; M. Artagaveytia, inspector general.
Fleet: six DC-3, four Heron, three Viscount 770.

Provincetown-Boston Airline operates feeder services between Provincetown Municipal Airport and Logan Airport, Boston, under the title "The Route of the Pilgrims."
Head Office: Provincetown, Mass., U.S.A.
Executives: J. C. van Arsdale, president/treasurer.
Fleet: Lockheed Electra and Cessna 190.

"Q" Airways—see Aerovias "Q," S.A.

Qantas Empire Airways, Ltd.—Q.E.A. was founded in January 1934 by Q.A.N.T.A.S. and Imperial Airways for the operation of the Singapore - Brisbane section of the England - Australia air route then about to be established. Q.A.N.T.A.S. (Queensland and Northern Territory Aerial Services) was founded on November 16, 1920, and on November 2, 1922, the company opened its first service between Charleville and Cloncurry. This was the first air service in eastern Australia and it was operated by Armstrong Whitworth FK.8 biplanes. Qantas now operates a network of routes in the southwest Pacific and New Guinea areas; to Europe; to the Philippines, Hong Kong and Tokyo; across the Indian Ocean to South Africa; and, since taking over B.C.P.A. in 1954, a trans-Pacific route to Honolulu, San Francisco and Vancouver, British Columbia. In 1957 this service was extended to the U.K., making Qantas a round-world carrier.
Head Office: Sydney, N.S.W., Australia.
Executives: Sir Hudson Fysh, chairman; C. O. Turner, chief executive/general manager; Capt. G. U. Allan, asst. general manager; Capt. R. J. Ritchie, technical manager; C. W. Nielson, commercial manager; F. C. Derham, finance manager/secretary.
Fleet: 16 L.1049G, two L.1049H, five DC-4, eight DC-3, four Beaver, one Drover, two Catalina. On order: seven Boeing 707 (1959).

Quebecair, Inc., was incorporated in 1947 as Rimouski Airlines, Ltd., and took its present name in 1953. Services are operated across and on either side of the St. Lawrence from Quebec in the west to Port Menier and Schefferville in the east.
Head Office: Rimouski, P.Q., Canada.
Executives: R. Crevier, president; P. Lapointe, operations manager; M. Tessier, secretary.
Fleet: two DC-4, six DC-3, three Canso, three Beaver, one Beech 18. On order: two Friendship (1958).

WORLD AIRLINE DIRECTORY

Queensland Airlines Pty., Ltd., was the name taken by Aircrafts Pty., Ltd., in 1947 when Butler Air Transport acquired control of the company by purchasing 93 per cent of the outstanding stock. Working under its separate identity, Queensland Airlines has a 2,700 mile network of services in Queensland and south to Sydney, N.S.W.
Head Office: Brisbane, Queensland, Australia.
Executives: R. S. Adair, managing director; D. C. McDonough, traffic manager; M. B. Mitchell, operations manager; A. Probert, chief engineer.
Fleet: three DC-3.

R.A.I.—see Regie Aerienne Interinsulaire.

RANSA—see Rutas Aereas Nacionales, S.A.

R.A.S.—see Rutas Aereas SAM, Ltda.

S.A. Transportes Aereos—REAL was founded in 1946 and by a series of mergers and acquisition of interest in other airlines the company is now the largest airline in South America. Subsidiaries include Aerovias Brasil, Aeronorte and T.A.S. In addition to its Brazilian services REAL operates to the Argentine, Uruguay, Trinidad, Venezuela, Miami and Chicago. Unduplicated route mileage is 70,000 miles and total staff numbers about 7,000.
Head Office: Sao Paulo, Brazil.
Executives: Linnau Gomes, president; Dr. L. C. Andrade, director engineering; Dr. A. T. Filho, director legal.
Fleet: 89 DC-3, 14 Convair 440, six Convair 340, 10 C-46, 10 DC-4. On order: three DC-7C.

Reeve Aleutian Airways, Inc. This concern was founded in 1932 but operated mainly charter services until 1948 when the C.A.B. granted the company a certificate of public convenience and necessity. Services are operated from Anchorage through the Aleutians to Attu and the company is authorized to fly on an irregular basis between any of its certificated points and the Pribilof Islands.
Head Office: Anchorage, Alaska.
Executives: R. C. Reeve, president; Robert L. Hanson, vice-president; Margaret Rutledge, secretary; Janice M. Reeve, treasurer.
Fleet: two DC-3, two Sikorsky S-43, one Goose, one DC-4, one C-46.

Régie Aérienne Interinsulaire began services in 1951, linking points in the Society Islands, some of which were previously served by Air Tahiti and T.R.A.P.A.S. Points served, apart from Papeete in Tahiti, are Huahine, Raiatea and Bora Bora. The French airline T.A.I. has recently acquired a controlling share in R.A.I.
Head Office: Papeete, Tahiti.
Executives: Chief of the Service of Public Works and Mines; Agent of Messageries Maritimes; R. Yvernat, manager.
Fleet: two Catalina.

Resort Airlines, Inc., is currently listed as a U.S. air carrier but no details are available on its present operations.
Head Office: Washington, D.C., U.S.A.
Executives: C. Davidson, Jnr., chairman; H. L. Graham, Jnr., president; J. P. Simpson, secretary.
Fleet: nine DC-4, two L.1049H.

Riddle Airlines, Inc., is an all-cargo operator, serving the U.S. East Coast, the Mid-West and Puerto Rico. Cargo operations began between Puerto Rico and New York in 1947, and in 1951 the company became a certificated all-cargo carrier linking various cities in Puerto Rico via Miami. In 1955 Riddle was certificated to serve 13 additional cities in the U.S. The company also has a U.S.A.F. contract worth £3½ million to fly cargo between bases from Maine to Florida and as far west as Texas. The majority shareholder in Riddle is Mr. Arthur Vining Davis.
Head Office: Miami, Florida, U.S.A.
Executives: J. P. Riddle, president; Rodney W. King, executive vice-president; P. T. Craven, Snr. vice-president/treasurer; Jane B. Ramsey, secretary; C. L. Hood, vice-president traffic and sales.
Fleet: four DC-4, 33 C-46.

Romanian State Airline—see TAROM.

Royal Air Cambodge began operations on November 1, 1956, and is flying services from Phnom-Penh to Kompongsom, Siem-Reap, Kratie, Stung-Treng, Savannakhet and Bangkok.
Head Office: Phnom-Penh, Cambodia.
Executives: Huot Sam Ath, chairman; Cyril Martin-Onraet, general manager.

Royal Air Maroc (was Air Atlas-Air Maroc) operates services in North Africa and between North Africa and France, Spain and Switzerland. The airline was founded in July 1953 by the amalgamation of the Casablanca-based Air Atlas and Air Maroc companies. Air Atlas was formed in 1946 and began operations with Junkers 52/3ms and Air Maroc was founded in 1947 and began scheduled services in 1949.
Head Office: Casablanca, Morocco.
Executives: M. Laraki, president; A. Faurous, director general; P. Valent, administrative director; F. Legras, commercial director; M. Delluc, technical director.
Fleet: four DC-4, three DC-3, seven Bretagne, two C-46.

Rutas Aereas Nacionales, S.A.—RANSA, was founded as a private company in 1948. The company has C.A.B. authorization to carry passengers, mail and cargo between Venezuela and Miami via Netherlands West Indies and Jamaica, but at present only cargo services are operated.
Head Office: Caracas, Venezuela.
Executives: C. Chavez, president; E. Pardey, general manager; E. E. Jones, vice-president; R. D. Borges, operations manager.
Fleet: 13 C-46, one DC-3, five Cessna 180, one Cessna 170, two Beaver, one Beech.

Rutas Aereas SAM, Ltda.—RAS, subsidiary of Sociedad Aeronautica Medellin, S.A., operates routes in the central and northern parts of Colombia serving Medellin, Bogota, Cali, Barranquilla, Santa Marta and other points.
Head Office: Medellin, Colombia.
Executives: C. V. Mendez, director.
Fleet: three DC-4, three DC-3.

S.A.A.—see South African Airways.

S.A. Empresa de Viação Aérea Rio Grandense, "VARIG," was founded in 1927, with the technical assistance of the German Condor Syndicate, for the operation of local services. The company now has an extensive route system in Brazil and also operates services to New York, Montevideo and Buenos Aires. In 1951 Varig took over Aero Geral, which was operating about 1,500 miles of domestic services. More than 80 per cent of Varig's capital is held by company employees, either privately or through the Foundation of Varig Employees. There is a small government holding.
Head Office: Porto Alegre, Brazil.
Executives: R. M. Berta, president; G. G. Herzfeldt, operations director; R. Schaly, director of traffic; H. Beaumel, director of maintenance; L. Zerwes, chief accountant.
Fleet: three L.1049G, five Convair 240, 14 Curtiss C-46, 23 DC-3. On order: two L.1049G.

S.A. Viacao Aerea Gaucha—SAVAG. Founded in 1946 as a private company to operate services in the State of Rio Grande, the original fleet consisted of three Lodestars. Present routes are from Porto Alegre to Livramento; Rio Grande to Porto Alegre and Bage; and Sao Paulo to Bage. Cruzeiro do Sul supplies SAVAG with crews, provides maintenance and technical assistance and also handles reservations.
Head Office: Rio Grande do Sul, Brazil.
Executives: E. C. Becker, president; V. V. de Fonesca, vice-president; T. Pruet, operations manager.
Fleet: DC-3.

The aircraft of Sabena Belgian World Airlines are finished in dark blue; this is a DC-7C.

Sabena Belgian World Airlines (Société Anonyme Belge d'Exploitation de la Navigation Aérienne) was founded in 1923 as successor to S.N.E.T.A. Sabena developed a European network and later routes to and in the Belgian Congo. The airline now has an extensive route network in Europe, to the Middle East, to Africa, within the Belgian Congo and to North America.

Sabena is the only operator of international helicopter services. Following several years of helicopter mail operation within Belgium, the company began passenger services to Holland and France on September 1, 1953, and its S-58s now fly from Brussels to Lille, Antwerp, Rotterdam, Eindhoven, Liège, Maastricht, Cologne, Bonn, Paris, Luxembourg, Saarbrücken, Duisburg and Dortmund.

During the Brussels 1958 Universal and International Exhibition Sabena plans to lease a Vertol 44 to carry out passenger services in connection with the Exhibition.

The Belgian Government has recently discussed an increase in Sabena's capital to permit procurement of jet aircraft. The Caravelle was mentioned as a likely purchase.
Head Office: Brussels, Belgium.
Executives: G. Périer, chairman; G. Claeys, managing director; W. Deswarte, president; G. Dieu, deputy president; A. Vernieuwe, senior vice-pres. operations; R. Golstein, secretary general; F. Pirson, senior vice-pres. technical.
Fleet: six DC-7C, eight DC-6B, three DC-6, two DC-6A, 12 Convair 440, four Convair 240, nine DC-4, 28 DC-3, eight S-58. On order: five Boeing 707-320 (1959), four DC-7C, five Cessna 310.

Sadia S.A. Transportes Aereos operates second-class scheduled services from Sao Paulo to Concordia, Porto Alegre and Brasilia, and from Londrina to Florianopolis, Ribeirao Preto and Rio de Janeiro.
Head Office: Sao Paulo, Brazil.
Fleet: one DC-3, two C-47, two C-46.

S.A.E.T.A.—see Sociedad Aerea del Tolima, S.A.

S.A.F.E.—see Braathens South American and Far East Airtransport A/S or Straits Air Freight Express.

SAGETA—Societe Auxiliare de Gerance et de Transports Aeriens is the largest non-scheduled French carrier. The airline works closely with Air France.
Head Office: Paris, France.
Executives: P. Marette, manager; C. Gonin, director.
Fleet: six Armagnac.

SAHSA—see Servicio Aereo de Honduras, S.A.

S.A.S.—see Scandinavian Airlines System.

Saskatchewan Government Airways was founded in 1947 by the provincial Government to take over the M. and C. Aviation Co. and to operate services to North Saskatchewan. The airline operates about 1,400 miles of routes northward from Prince Albert and serves places with such delightful names as Uranium City, Goldfields, Stony Rapids, Buffalo Narrows, Snake Lake, Pelican Narrows and Flin Flon. S.G.A. also leases aircraft to the Air Ambulance Service and the Forest Fire Control Branch of the Department of Natural Resources.
Head Office: Prince Albert, Sask., Canada.
Executives: W. A. Houseman, chairman; Hon. A. G. Kusiak, minister; I. Macleod, general manager; F. R. Baudais, operations manager; J. A. Pool, chief engineer.
Fleet: two DC-3, four Norseman, one Otter, five Beaver, one Cessna 140, nine Cessna 180, one Cessna 170, one Piper Super Cub.

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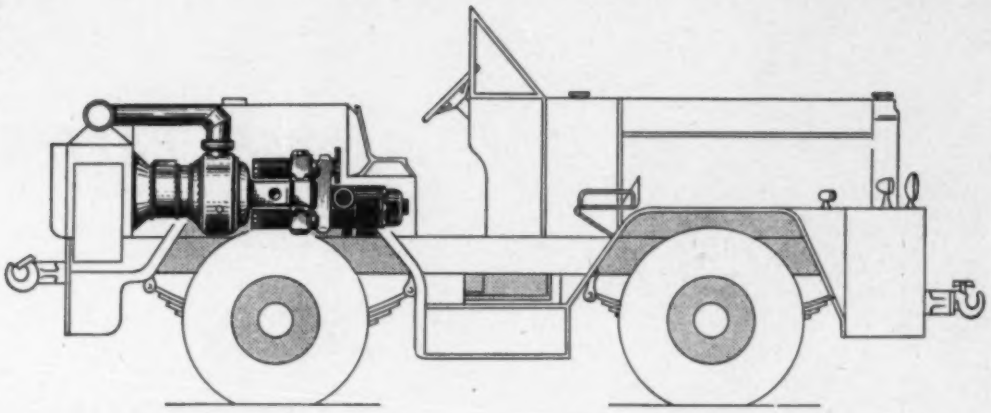

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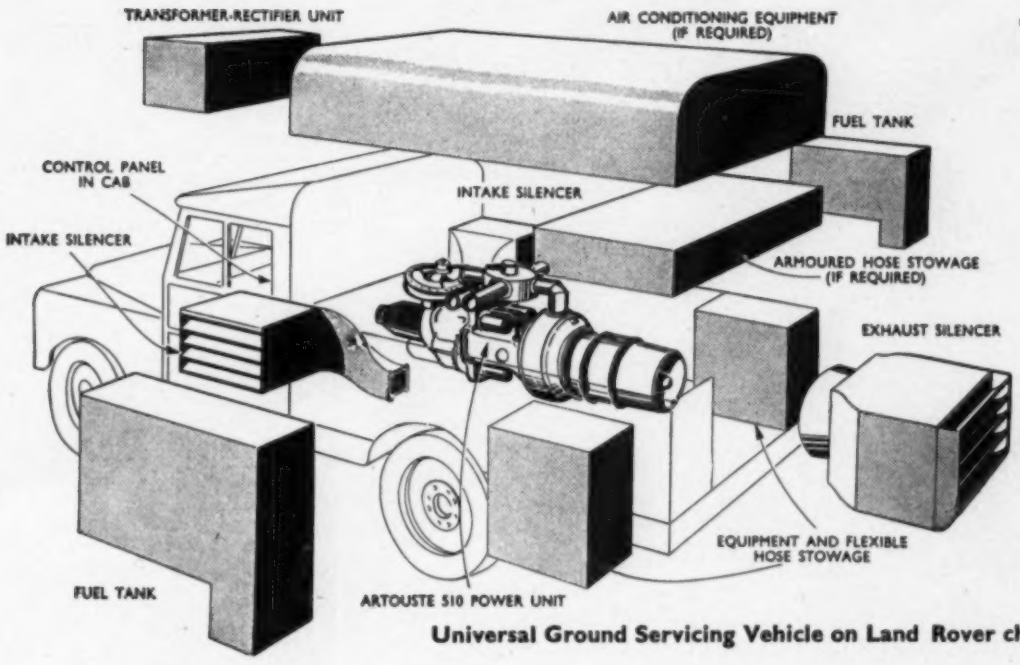

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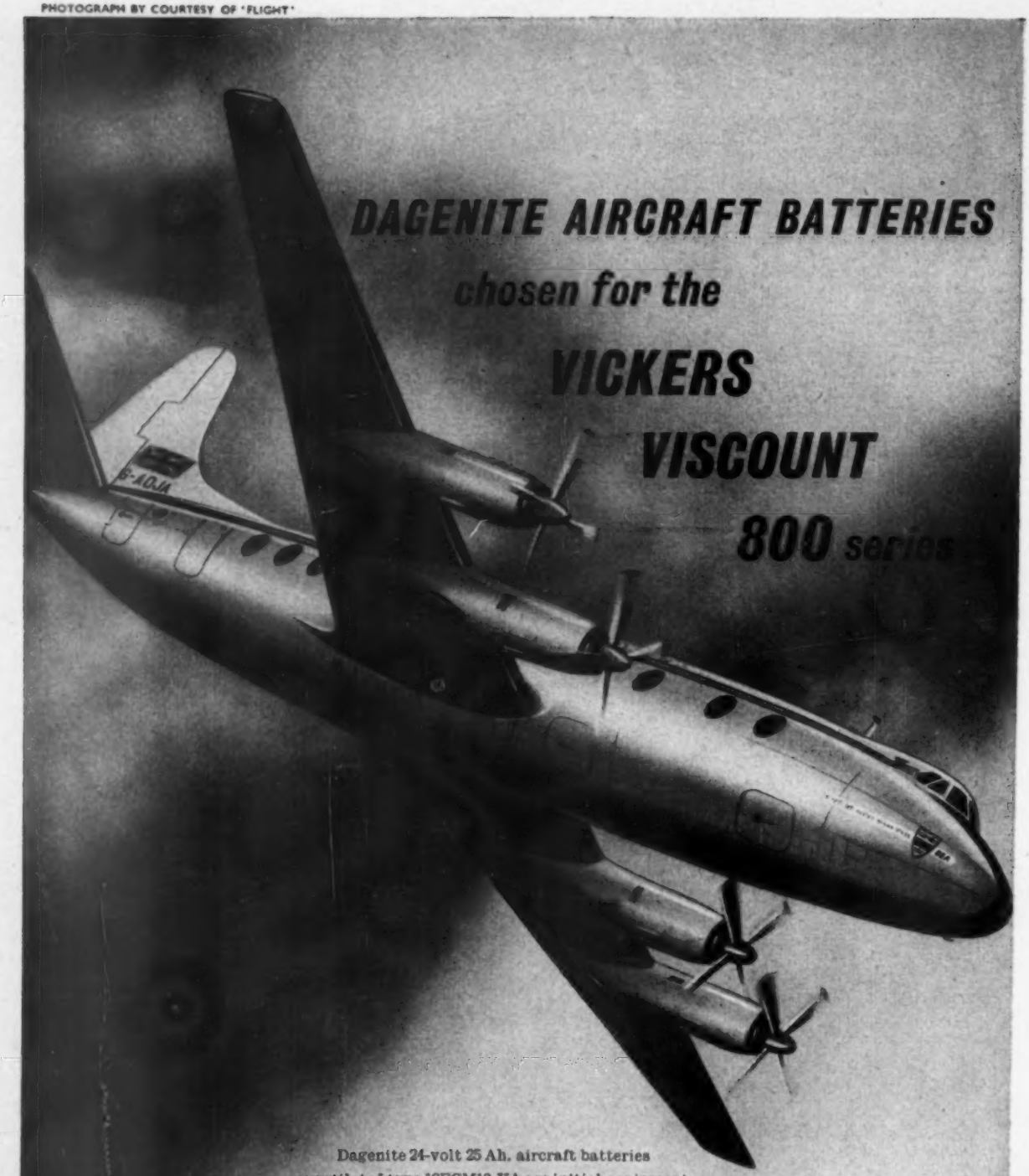

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WORLD AIRLINE DIRECTORY...

SATA—see Sociedade Açorianá de Transportes Aéreos, Ltda.

Saudi Arabian Airlines was founded in 1946 by the Government and is managed by T.W.A. The airline began operations in 1947 and now has about 6,000 miles of routes within Saudi Arabia and to Egypt, the Lebanon, Jordan, Sudan and Syria. Considerable pilgrim traffic is carried.
Head Office: Jedda, Saudi Arabia.
Executives: R. W. Wilson, technical manager; S. M. Bigler, supt. flight operations.
Fleet: 10 Convair 340, four DC-4, 10 DC-3, five Bristol 170.

SAVAG—see S.A. Viacao Aerea Gaucha.

Scandinavian Airlines System—S.A.S. is a consortium of Swedish Air Lines (A.B.A.), Danish Air Lines (D.D.L.) and Norwegian Air Lines (D.N.L.) in the proportions 3, 2 and 2. S.A.S. originally came into being, in 1946, for the operation of transatlantic services, and both North and South Atlantic routes were opened in that year. All routes of the three airlines are now operated by S.A.S. with the original airlines acting as holding companies.

S.A.S. maintains Scandinavian internal services, a European network, and routes to South Africa, the Middle and Far East, and to North and South America. In 1954 a northern route between Scandinavia and the west coast of the U.S.A. was opened, and a trans-Polar route to the Far East was opened last year.
Head Office: Stockholm, Sweden.
Executives: H. Throne-Holst, president; P. Hansson, chairman; S. Ostling, V. J. Rasmussen, T. A. Boye, N. Langhelle, executive vice-presidents; K. Hagerup-Svendsen, vice-president operations.
Fleet: 14 DC-7C, 13 DC-6B, 12 DC-6, 20 Convair 440. On order: seven DC-8 (1959/60), six Caravelle.

Scheduled Skyways System operates three services a day between Fayetteville and Little Rock.
Head Office: Fayetteville, Arkansas, U.S.A.
Fleet: Cessna 180.

Seaboard and Western Airlines, Inc., is a well established scheduled cargo carrier. The company began operations in 1951 and on April 10, 1956, began scheduled North Atlantic operations between New York and Shannon, London, Glasgow, Brussels, Amsterdam, Hamburg, Cologne, Weisbaden, Düsseldorf, Frankfurt, Nuremburg, Stuttgart, Munich, Paris, Geneva and Zürich in Europe. Seaboard has interline agreements with many U.S. and foreign scheduled airlines. B.O.A.C. is general sales agent for Seaboard and Western in the United Kingdom.
Head Office: New York, U.S.A.

Swissair Convair 440 seen from one of the company's DC-7Cs.

Executives: R. A. Norden, president; A. V. Norden, executive vice-president/treasurer; C. D. Brell, vice-president operations; W. P. Neth, vice-president traffic/secretary.
Fleet: 10 L.1049, four DC-4, one C-46.

Servicio Aereo de Honduras, S.A.—SAHSA, was founded in 1945 by Honduras private interests and Pan American Airways. Operations were begun in October 1945. The company operates a network of routes in Honduras and a route between San Pedro and Belize in British Honduras. In 1953 SAHSA acquired all the stock of TACA de Honduras but the latter concern continues to operate as a separate company.
Head Office: Tegucigalpa, Honduras.
Executives: R. Z. Romero, president/general manager; J. O. Duran, first vice-president; F. Lardizabal, treasurer; Herman Coello, secretary.
Fleet: seven DC-3.

Serviço de Transportes Aéreos—S.T.A. is at present operating regular services between the islands of Sao Tomé and Principe off the west coast of Africa.
Head Office: Sao Tomé, Province of Sao Tomé and Principe, Portuguese West Africa.
Executive: V. C. Cortes, chief executive.
Fleet: three D.H.89, one Tiger Moth, one Piper Super Cruiser, one Autocar.

Servicios Aereos Del Paraguay, S.A., is in the process of formation, regional services being planned from Asunción.
Head Office: Asunción, Paraguay.
Executive: Dr. A. Negues, president.
Fleet: On order: two C-46, three L-049.

Serviços Aéreos Cruzeiro do Sul, S.A.—Cruzeiro. This airline's history goes back to December 1927 when Syndicato Condor Ltda. was founded by German interests. A coastal route was established from Belem through Rio de Janeiro and on to Buenos Aires and across the Andes to Santiago in Chile. From Natal south this formed part of the German route to South America opened in 1934. Dornier Wal, Junkers F13 and W34s were used by Condor and later Ju 52s and Focke Wulf Condors came into service. In 1942 the company was reorganized, cleared of German control and given its present name. The company now operates more than 18,000 miles of routes in Brazil and between Brazil and neighbouring countries.
Head Office: Rio de Janeiro, Brazil.
Executives: Dr. J. B. R. Dantas, president; J. Q. V. de Carvalho, commercial director; Col. F. A. Roche, operations director.
Fleet: 34 DC-3, four Convair 340, four Beech AT-11.

Slick Airways, Inc., is one of the largest U.S. scheduled cargo carriers. Its services include transcontinental operations from Boston and New York to Los Angeles and San Francisco, most flights serve Chicago. The Chesapeake and Ohio Railway is now a major shareholder in Slick. The airline was founded in 1946 and began operation as a contract cargo carrier. Scheduled services were authorized in 1949. Financial difficulties led the company to suspend all scheduled services in spring 1958.
Head Office: Dallas, Texas, U.S.A.
Executives: Robert J. Smith, president; John E. Muhlfield, vice-president sales and traffic; Henry P. Huff, Jnr., vice-president operations and maintenance; Alwin Johnson, vice-president finance; Herman Ruppel, treasurer; John W. Walbert, secretary.
Fleet: seven DC-6A, eight DC-4, 13 C-46.

S.L.M.—see Surinaamsche Lugvaart Maatschappij.

Sobelair—see Société Belge de Transports par Air, S.A.

Sociedad Aerea del Tolima, S.A.—S.A.D.T.A operates domestic services within Colombia.
Fleet: five DC-3.

Sociedad Aeronautica Medellin, S.A. (S.A.M.)—see Rutas Aereas SAM, Ltda.

Sociedad de Transportes Aereos, Ltda.—see A.L.A.

Viscount V-794 of Türk Hava Yollari.

WORLD AIRLINE DIRECTORY...

Sociedade Açoriana de Transportes Aéreos, Ltda.—SATA. This company began operations in 1948 and now has 313 miles of routes. Three services a week are operated between São Miguel and Santa Maria and three flights a week serve Terceira.
Head Office: São Miguel, Azores.
Executives: A. M. Noqueira, operations manager; V. A. Portugal, traffic manager.
Fleet: two Dove.

Société Aérienne de Transport Guyane Antilles—SATGA (French Guiana Air Transport), flies local services in French Guiana. Cayenne, St. Laurent, St. Georges, Maripasoula and Saul are served by scheduled flights. Delice is served on request for cargo or ambulance calls.
Head Office: Cayenne, French Guiana.
Fleet: D.H.89, Vultee L-13.

Société Anonyme Belge d'Exploitation de la Navigation Aérienne—see SABENA.

Société Auxiliaire de Gerance et de Transports Aériens—see SAGETA.

Société Belge de Transports par Air—Sobelair is primarily engaged on charter flights between Belgium and the Congo but a domestic network within the Congo was established in 1957. Sobelair is a subsidiary of Sabena.
Head Office: Brussels, Belgium.
Executives: G. Claeys, managing director; A. Philippe, general manager; P. Bertin, commercial manager.
Fleet: two DC-4, two Cessna 310.

Société Calédonienne de Transports Aériens "Transpac," operates services between Noumea and Isle of Pines, Lifu, Uvea and Maré.
Head Office: Noumea, New Caledonia.
Executives: H. G. Martinet, president; H. C. Coursin, manager; J. A. Lafargue, chief pilot; M. A. Couillaud, chief engineer.
Fleet: three D.H.89.

Société de Transports Aériens en Extrême Orient—COSARA operates non-scheduled services from Saigon.
Head Office: Saigon, Vietnam.
Executives: Pham Hoe, managing director; M. Loubiere, director general.
Fleet: four DC-4, four Bretagne.

Société Tunisienne de L'Air—see Tunisair.

South African Airways was formed in 1934 to take over Union Airways, and the airline is owned and controlled by the Government through the South African Railways and Harbours Administration. In 1935 the new airline acquired South West African Airways. SAA now operates an internal network of routes and also has services to Rhodesia and Europe. A new Johannesburg - London route via Leopoldville, Kano and Algiers was opened with DC-7Bs in 1956.
Head Office: Johannesburg, Transvaal, Union of South Africa.
Executives: D. H. du Plessis, general manager; D. Robbertze, deputy general manager.
Fleet: four DC-7B, four L-749A, seven DC-4, six DC-3. On order: seven Viscount 813.

Southeast Airlines, Inc., operates scheduled services within Tennessee.
Head Office: Kingsport, Tennessee, U.S.A.
Executives: E. W. King, president; W. Steele, vice-president.
Fleet: five DC-3.

Southern Airlines, Ltd., was founded in April 1955 and operates services from Melbourne to Sale, Bairnsdale, Shepparton, Benalla, Warrnambool, Tocumwal, Kerang, Swan Hill, Flinders Island and Balranald.
Head Office: Melbourne, Victoria, Australia.
Executives: Sir R. Barnewall, chairman; L. Edwards, operations manager.
Fleet: two Dove.

Southern Airways, Inc., was founded in July 1943 and began operations in June 1949. Twenty-eight cities are served in the states of Georgia, Alabama, Mississippi, Louisiana, Tennessee, Florida and North and South Carolina. Permanent certification was granted in May 1955.
Head Office: Birmingham, Alabama, U.S.A.
Executives: F. W. Hulse, president; C. M. Britt, vice-president sales; W. S. Magill, vice-president operations; G. Estey, secretary/treasurer.
Fleet: 13 DC-3.

T.C.A.'s international operations are based on their fleet of 11 piston-engined Super Constellation L.1049Gs.

South West Air Transport (Pty.), Ltd., has for several years been operating feeder services connecting with South African Airways' flights at Windhoek. Operations include five weekly services between Windhoek and Otjiwarongo, Outjo, Tsumeb and Grootfontein and a twice weekly service Windhoek and Walvis Bay.
Head Office: Windhoek, South West Africa.
Executives: P. H. M. Du Plessis, chairman; G. T. van Rooyen, managing director; A. K. L. Finke, chief engineer.
Fleet: seven Ryan Navion, one D.H.89.

Southwest Airways Co.—see Pacific Air Lines.

Spartan Air Services, Ltd., concentrates on aerial survey, using helicopters in Canada and in many countries abroad.
Head Office: Ottawa, Canada.
Executives: J. Roberts, president; R. Hall, secretary; J. Wells, vice-president.
Fleet: 14 Bell 47.

St. Vincent Government Air Service operates services between St. Vincent and Barbados, Dominica, Grenada and Trinidad under charter to British Guiana Airways.
Fleet: Grumman Goose.

Straits Air Freight Express, a subsidiary of Airwork, Ltd., is primarily engaged on scheduled freight services linking the North and South Islands of New Zealand. Their development of the "Cargon" loading system has been widely adopted elsewhere.
Head Office: Wellington, New Zealand.
Executives: J. Sawers, chairman; D. Hay, secretary; R. Hamilton, operations manager.
Fleet: four Bristol 170.

Sudan Airways is government-owned and began operations in 1947. Routes extend throughout the Sudan from Wadi Halfa in the north to Juba in the south; and from Geneina in the west to Port Sudan in the east. International routes serve Aden, Asmara and Cairo.
Head Office: Khartoum, Sudan.
Executives: Abdel Bagi Mohamed, general manager; Y. Bakheit, traffic superintendent (admin.); M. H. A. Bashendi, traffic superintendent (technical); M. El Amir, sales superintendent; C. E. Blake, chief accountant; D. W. Graham, chief pilot; R. D. Collins, chief engineer; H. Ahmed, operations superintendent.
Fleet: five DC-3, four Dove.

Suid-Afrikaanse Lugdiens—see South African Airways.

Surinam Airways—Surinaamsche Luchtvaart Maatschappij, N.V., operates internal services in Dutch Guiana from Paramaribo to Moengo and Nickerie.
Head Office: Paramaribo, Surinam.
Fleet: Cessna, Aero Commander.

Swissair—Swiss Air Transport Co., Ltd., was founded on March 26th, 1931, by the amalgamation of Ad Astra Aero A.G. and the Basle Air Traffic Co., known as Balair. Ad Astra was founded in 1919 and began flying-boat services linking Swiss cities, before pioneering international routes. Thus Swissair can claim, with its predecessors, 39 years of continuous operation, although its activities were severely restricted during the war. Since the war the company has grown rapidly and it now operates a network of European routes, and has services to North and South America and the Near East and Far East.
Head Office: Zürich, Switzerland.
Executives: Dr. W. Berchtold, president; E. Schmidheiny, chairman; E. Groh, vice-president finance; L. L. Ambord, vice-president traffic and sales; R. Fretz, vice-president operations; I. Lack, vice-president maintenance; A. Baltensweiler, vice-president planning.
Fleet: four DC-7C, six DC-6B, three DC-4, eight DC-3, 11 Convair 440. On order: three DC-8, one DC-7C, one DC-6A.

Syrian Airways Company was formed in 1946 and began operations in 1947. Financial difficulties caused the suspension of services in 1948, but after receiving Government support operations were resumed in 1951. The company now flies domestic services and also has international routes to the Lebanon, Egypt, Saudi Arabia, Iraq and Kuwait. Creation of the United Arab Republic will probably result in this airline merging with Misrair.
Head Office: Damascus, Syria.
Executives: not known.
Fleet: four DC-3, two DC-4.

T.A.A.—see Trans-Australia Airlines.

T.A.B.—see Transportes Aereos Bandeirantes.

TABSO—Bulgarian Civil Air Transport, operates domestic services and routes to Belgrade, Budapest, Prague, Warsaw and Berlin. The airline came into being after the war as the Government's Bulgarske Vazdusne Sobstenie and in 1949 it became TABSO, in which Bulgaria and the U.S.S.R. each held 50 per cent. The U.S.S.R. withdrew its interest in 1954.
Head Office: Sofia, Bulgaria.
Fleet: Li-2, Il-14.

T.A.C.—see Empresa de Transportes Aereos Catarinense, S.A.

TACA de Honduras, now a subsidiary of SAHSA, began charter operations in 1931 and became part of the TACA System in 1932. Scheduled services were begun in 1944. The TACA System sold its interests in the company in 1948. The company operates a domestic network of services.
Head Office: Tegucigalpa, Honduras.
Executives: A. Rodriguez, president; W. A. Buxbaum, treasurer; C. A. Garcia, secretary.
Fleet: DC-3.

TACA International Airlines, S.A., was founded in Salvador in 1939 as a subsidiary of the U.S. TACA Corporation. Although TACA once controlled a number of airlines, TACA International is now the only one still operated by the Corporation. Routes extend from New Orleans and Mexico City through Guatemala, San Salvador, Tegucigalpa and Managua to San José, in Costa Rica, and Panama. A scheduled freight service is operated once a week between New Orleans and Guatemala, Route mileage is 3,980.
Head Office: New Orleans, Louisiana, U.S.A. (operating from San Salvador).
Executives: R. H. Kreite, president; R. E. Clipson, vice-president operations; J. D. Brock, vice-president traffic; W. B. Daly, treasurer; E. Canas, secretary.
Fleet: DC-4, one Viscount.

T.A.E.—see Olympic Airways.

TAG Airlines, Inc., formerly known as Taxi Air Group, began operations in April 1956 of a floatplane service linking downtown Detroit with downtown Cleveland. The company operates this service during the summer months but cannot use floatplanes off the lakes in winter; to overcome this problem and seasonal traffic drop the fleet is based on Miami during winter and services are operated to Fort Lauderdale, Boca Raton, Stuart, Key Largo and Marathon.
Head Office: Toledo, Ohio.
Executives: E. F. Knight, general manager; W. W. Knight, Jr., secretary/treasurer; E. A. Eklund, vice-president operations; W. J. Swann, vice-president sales.
Fleet: two Otter, one Beaver.

T.A.I.—see Compagnie de Transports Aériens Intercontinentaux.

TAN Airlines—see Transportes Aereos Nacionales, S.A.

T.A.P.—see Transportes Aéreos Portugueses.

T.A.P. (Brazil)—see Transportes Aereos Paraense.

TAROM—see Transporturi Aeriene Romine.

T.A.S.—see Transportes Aereos Salvador, Ltda.

Tasman Empire Airways, Ltd., was formed in 1940 as a joint British - Australian - New Zealand company for the operation of services linking New Zealand and Australia. Operating Short C-class flying-boats, it maintained during the war the only regular passenger service of any kind between the two countries. In 1954 Britain withdrew and Teal is now owned jointly by the New Zealand and Australian Governments.

DC-6s replaced flying-boats on the trans-Tasman and Fiji services in 1954, but Solents are used on the Coral Route from Fiji to Tahiti via Samoa and Cook Islands, and between Fiji and Tonga. The company has 10,499 miles of routes in operation.
Head Office: Auckland, New Zealand.
Executives: Sir Leonard Isitt, chairman; J. W. Veale, asst. general manager (commercial); F. A. Reeves, asst. general manager (technical); K. A. Brownjohn, operations manager; D. W. Banks, secretary; A. A. Watson, accountant.
Fleet: three DC-6; one Solent.

T.C.A.—see Trans-Canada Air Lines.

T.E.A.L.—see Tasman Empire Airways, Ltd.

Thai Airways Company, Ltd.—TAC, was formed in 1951 by the merger of Siamese Airways Co., Ltd., and Pacific Overseas Airlines (Siam), Ltd. The Government is believed to hold almost the entire stock. Thai Airways maintains domestic services and also operates to Calcutta, Rangoon, Hong Kong, Formosa, Tokyo, Vientiane, Saigon, Phnompenh, Siemreap, Penang and Singapore.
Head Office: Bangkok, Thailand.
Executives: Lt. Gen. Banyat Devahastin, chairman; P. Limpisvasti, vice-chairman; Sakol Rasananda, managing director airline.
Fleet: three DC-4, four DC-3, two Norseman, one C-46, one Bonanza.

Tourist Air Travel commenced a thrice-weekly service between Wellington and Waiheke Island in October 1957.

Trans-Air, Ltd., was formed recently by the amalgamation of Central Northern Airways and Arctic Wings. Central Northern Airways was formed in 1947 to acquire and operate some bush routes formerly operated, in Saskatchewan, Manitoba and Ontario, by Canadian Pacific Air Lines. Arctic Wings, based at Churchill on Hudson Bay, had been operating scheduled passenger and mail flights north to Baker Lake and south to Fort Severn. Charter flights and occasional mail services extended to the far north and served Arctic Bay and Pond Inlet on Baffin Island.
Head Office: Winnipeg, Manitoba, Canada.
Executives: G. H. Sellers, chairman; R. D. Turner, president; F. C. McKay, secretary-treasurer.
Fleet: two Anson, three Beaver, one Bellanca 66-75, one Bristol 170, four Canso, four Cessna, one DC-3, one DC-4, one Lockheed 12A, 15 Norseman, one Waco YKC-S, one Waco AQC-8, one York.

Transa Chile, Ltda., is a small company primarily engaged on charter flights.
Head Office: Santiago, Chile.
Executives: F. O. Devoto, president; M. C. Fischer, executive vice-president.
Fleet: three C-46, two Canso.

Transair Sweden A.B. Details of the company's present operations are not available, but in addition to charter flying and the operation of inclusive tours, Transair Sweden has operated scheduled services on behalf of S.A.S., including some between Stockholm and Visby.
Head Office: Stockholm, Sweden.
Executives: P. Loven, managing director.
Fleet: three DC-3, two Consul, three C-46.

Trans-Australia Airlines was set up, and is controlled on behalf of the State, by the Australian National Airlines Commission, for the operation of domestic services. Operations began in 1946 and have been extremely successful; its present route mileage of 32,228 makes it the largest domestic airline in the Commonwealth.

A network of routes link Melbourne, Adelaide, Sydney, Brisbane and Hobart. A coastal route serves Townsville and Cairns; there are routes from both Adelaide and Brisbane to Darwin and one from Adelaide to Perth. T.A.A. was the first Australian airline to operate Viscounts.
Head Office: Melbourne, Victoria, Australia.
Executives: W. D. McDonald, chairman; S. N. Crawford, secretary; J. P. Ryland, gen. mgr.; R. E. Bailey, dir., operations; J. Borthwick, commercial director; H. L. Brown, chief accountant.
Fleet: 11 Viscount, two Convair 240, four DC-4, 22 DC-3, four Drover, one Hiller UH-12C. On order: three Viscount (1958), six Friendship (1959).

Trans-Canada Air Lines was founded in 1937 as the nationally-owned airline, with the stock being held by the Government Canadian National Railways. The company began operations between Vancouver and Seattle and established air mail services between Montreal and Vancouver by October 1938 and transcontinental passenger services by April 1939. In May 1947, T.C.A. took over commercial operation of its wartime-established trans-atlantic services to Britain.

The airline now operates transcontinental services, services to Europe, the U.S.A., Bermuda, Jamaica, the Bahamas and Trinidad. T.C.A. was the first airline to introduce Viscount services in North America.
Head Office: Montreal, Canada.
Executives: G. R. McGregor, president; H. W. Seagrim, vice-president operations; W. G. Wood, vice-president sales; R. H. Tarr, secretary; G. S. Cowie, treasurer.
Fleet: 11 L-1049, 20 Canadair North Star, 31 Viscount, 17 DC-3. On order: 20 Vanguard, six DC-8, 20 Viscount.

Trans-Caribbean Airways, Inc., operates weekend services, at low fares, between New York and San Juan, Puerto Rico.
Head Office: New York City, New York, U.S.A.
Executives: O. Roy Chalk, president; Irving M. Buckley, vice-president/treasurer; D. J. McFarland, director traffic and operations.
Fleet: DC-6, DC-4, C-46.

Transcontinental, S.A., was founded in 1956 to operate scheduled services within Argentina and to the U.S. California Eastern Airlines holds a 25 per cent share.
Head Office: Buenos Aires, Argentina.
Executive: E. Maslorenz, president.
Fleet: three C-46, two L-1049H.

Trans Island Airways, Ltd., was set up as a result of a meeting of Oamaru businessmen in February 1956 to decide on the provision of air services for North Otago, South Canterbury and Nelson. Licences were obtained for regular services between Christchurch and Timaru, Oamaru, Nelson, Rongotai, West Coast, and Chatham Islands. A licence has also been obtained for Rongotai-Chatham Is. services and for charter operations from both Christchurch and Oamaru. The first route to be opened, in April 1956, was Christchurch - Timaru - Oamaru operated with a D.H.89 and mail contracts were obtained for that route and also for the Christchurch - Nelson route.
Head Office: Oamaru, New Zealand.
Executives: K. T. Cusack, secretary; Brian G. Chadwick, chief pilot.
Fleet: one D.H.89, two Beech D.18S.

Trans Mar de Cortés was founded as a private company in 1947 and began operations in December 1948 with freight and mail services. Passenger carriage began in 1949 and in July 1952 the company took over Lineas Aereos del Pacifico. A network of routes is operated in the Gulf of California area.
Head Office: Guaymas, Sonora, Mexico.
Executives: M. Obregon, director/manager; L. Coppola, general manager; T. B. Lee, operations manager.
Fleet: three DC-3.

Trans Mediterranean Airways operates a fleet of seven York freighters on charter services.
Head Office: Beirut, Lebanon.
Fleet: seven York.

Transocean Air Lines, is a U.S. supplemental carrier operating a scheduled weekly service between Oakland and Okinawa *via* Honolulu, Wake Island and Guam. Other services are operated between Oakland, Burbank and Honolulu. Transocean is responsible for the Trust Territory Operations in the Pacific and also has interests in Air Jordan and Iranair.
Head Office: Oakland, California, U.S.A.

Among the very few remaining operators to use Short Solents, T.E.A.L. have one of these aircraft on their Pacific "Coral" routes.

Executives: O. M. Nelson, president and chairman; S. A. Nichols, secretary/treasurer.
Fleet: two L.1049; one L.749; six DC-4, three SA-16. On order: four L.1049H.

Transocean Air Lines (Trust Territory Operations). The Trust Territory of the Pacific Island includes the Carolines, the Marshall Islands and the Marianas. Some of the main islands in these groups were occupied under mandate by the Japanese until they were driven out during the war. The Trust Territory was then set up by United Nations with the U.S.A. as trustee. Transocean Air Lines was awarded a contract to provide air communication and emergency services in the area, and began passenger, mail and freight operations there in June 1951 with Cansos. Albatross amphibians now fly from Guam to Yap, Truk, Koror, Ponape and Majuro.
Head Office (Trust Territory Ops.): Guam, Marianas Islands.
Fleet: three Grumman Albatross.

Trans-Pacific Airlines, Ltd. (TPA Aloha Airline), was founded in June 1946 and began non-scheduled passenger and cargo services on July 26 that year. A certificate for scheduled operation was applied for in 1946 and TPA worked as a common carrier until restrained in September 1947. The C.A.B. authorized scheduled services to eight cities on six islands in 1948, the President of the United States approved in February 1949 and regular scheduled services began in June 1949. TPA's routes are essentially similar to those operated by the long established Hawaiian Airlines.
Head Office: Honolulu, Hawaii.
Executives: R. F. Tongg, president; W. E. Wood, vice-president sales; O. V. Andrew, operations manager; D. A. Benz, executive vice-president; C. Young, treasurer.
Fleet: eight DC-3.

Transportes Aereos Bandeirantes. T.A.B. operates internal services within Brazil. A small subsidy is received from the Government.

Transportes Aereos Catarinense, S.A., operates coastal routes north from Florianopolis to Rio de Janeiro and south from Florianopolis to Porto Alegre and Bage. Cruzeiro do Sul provides TAC with crews and technical assistance.
Head Office: Florianopolis, Brazil.
Executives: Dr. J. D. F. Lima, president; G. M. Lins, vice-president/secretary.
Fleet: DC-3.

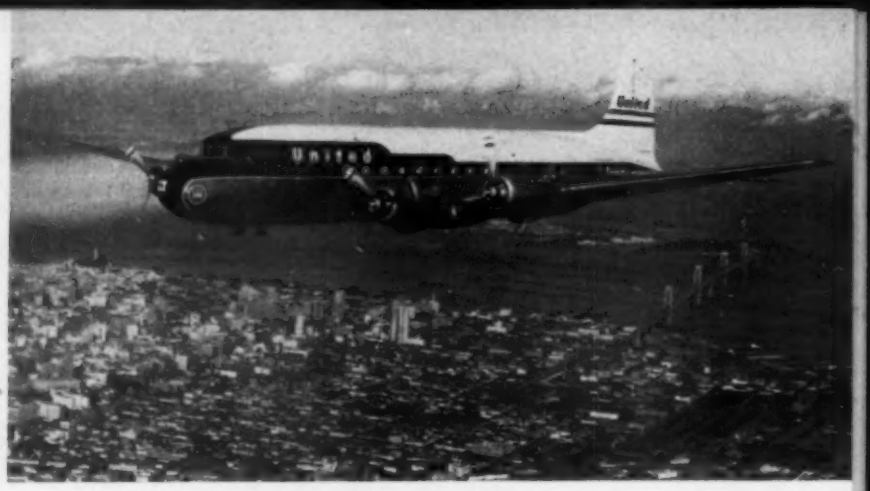
Transportes Aereos de Chile—see Transa Chile, Ltda.

Transportes Aéreos da India Portuguesa operates services from Goa.
Head Office: Goa.
Executives: Maj. A. G. Solano d'Almeida, director.
Fleet: two Heron 2, two Viking, one DC-4.

Transportes Aereos Nacionales, S.A.—TAN Airlines was founded by Honduras private interests in 1947 for the operation of contract cargo flights. The company built up substantial cargo traffic and in 1950 scheduled passenger and freight operations were begun. There is now a small U.S. private holding in the company. TAN's routes now serve Miami, Cuba, El Salvador, Guatemala, Nicaragua, Ecuador and Peru, in addition to Honduras. Unduplicated route mileage is 1,180.
Head Office: Tegucigalpa, Honduras.
Executives: M. Brooks, president; R. Alvarez, secretary; C. W. Shelton, vice-president.
Fleet: five C-46.

Transportes Aereos Paraense. T.A.P. has been recently established to operate a service from Belem to Rio de Janeiro via Pedro Alfonso and Brasilia.
Head Office: Belem.

Transportes Aéreos Portugueses, S.A.R.L.—TAP, was organized in 1944 as a division of the Civil Aviation Department. Its first route, between Lisbon and Madrid, was opened in September 1946. Services to Angola and Mozambique were opened in the following year. A large part of the stock of TAP is now privately owned. The company operates services between Lisbon and Oporto and international services to Tangier, Casablanca, Paris, Madrid, London, Luanda and Lourenço Marques.



A United DC-6 over the Golden Gate Bridge, San Francisco.

Head Office: Lisbon, Portugal.
Executives: D. F. de Mello e Castro, chairman; E. Coelho, executive general secretary; H. Costa, commercial manager; R. de Avelar, operations superintendent; J. C. Ferreira, maintenance superintendent.
Fleet: six DC-3, three DC-4, three L-1049G.

Transportes Aereos Salvador, Ltda.—T.A.S. started as a charter operator in 1949 and began scheduled operations within the State of Bahia in 1953. A network of local services is now being operated, although various difficulties brought about the suspension of operations during part of 1953. The company is associated with Real.
Head Office: Salvador, Bahia, Brazil.
Executives: C. P. Horta, general manager; J. F. P. Horta, technical manager.
Fleet: DC-3.

Transportes Aériens du Gabon, began regular operations in 1951 and now links a score of places with Libreville.
Head Office: Libreville, Gabon, Fr. Equatorial Africa.
Fleet: four D.H.89, four Cessna 170B, two Autocrat, one Proctor 5.

Transporturi Aeriene Romine—TAROM (Rumanian Air Lines) is the Rumanian State airline which in 1954 succeeded the joint Soviet - Rumanian TARS, which was formed in 1946. TAROM has about 5,000 miles of routes and operates services within Rumania and to Budapest, Belgrade, Prague and Berlin.
Head Office: Bucharest, Rumania.
Executives: Ing. Stingaciu, manager; Gheorghe Vaduva, asst. manager; S. Andrei, chief engineer.
Fleet: Li-2, Il-12, Il-14.

Trans-Texas Airways was founded in 1944 as Aviation Enterprises and began scheduled operation in October 1947. The airline now has about 3,000 miles of routes within Texas and between that state and Louisiana, Tennessee and Arkansas.
Head Office: Houston, Texas, U.S.A.
Executives: R. E. McKeughan, president; H. E. Erdmann, vice-president operations; L. J. Eichner, vice-president traffic and sales; M. L. Muse, secretary/treasurer.
Fleet: 20 DC-3.

Trans World Airlines, Inc., claims its origin in Western Air Express, which was founded in 1925 to bid for an air mail route from Los Angeles to Salt Lake City. WAE began mail service in 1926. In 1929 Transcontinental Air Transport, which had inaugurated a combined rail-air transcontinental route, obtained control of Maddux Air Lines. At about the same time Western Air Express absorbed Standard Air Lines and then on October 1, 1930, TAT-Maddux and Western Air Express completed a merger to form Transcontinental and Western Air, Inc. (TWA). In 1934, reconstitution followed the Post Office mail-flying upheaval, and it took its present title in 1950. TWA has been responsible for the initiation of some fine aircraft, having issued the specification for the Douglas DC-1/DC-2, the Stratoliner and the Constellation. TWA now has more than 35,000 miles of routes stretching from coast to coast of the U.S.A.; across the North Atlantic to Europe, North Africa and Asia. The company also serves Manila where connections with Northwest provide a round-world service.
Head Office: New York, N.Y., U.S.A.
Executives: Warren Lee Pierson, chairman; Carter L. Burgess, president; A. V. Leslie, senior vice-president finance; E. O. Cocke, senior vice-president sales.
Fleet: 28 L-1049G, nine L-1049A, 71 Constellation, four DC-4, five DC-3, 11 Martin 2-0-2, 37 Martin 4-0-4, one Fairchild C-82, 29 L-1649A. On order: 30 Convair 880 (1960), eight Boeing 707 (1959).

Trust Territory Operations—see Transocean Air Lines. (Trust Territory Operations.)

Tunis Air, Société Tunisienne de l'Air, was founded in 1948 by the Tunisian Government, Air France and other interests. It operates internal services and routes to Algeria, Libya, Corsica, France and Italy.
Head Office: Tunis, Tunisia.
Executives: P. F. Delaunay, general manager; M. Sartre, commercial manager; M. Gauthier, technical manager.
Fleet: two DC-4, three DC-3.

Türk Hava Yollari Anonim Ortakligi, formerly known as Devlet Hava Yollari (Turkish State Air Lines) was set up by the Government in 1933 as part of the Turkish Air Force. Control passed to the Ministry of Communications in 1939. Operations were confined to domestic services until 1949. The airline now operates an internal network of passenger services and a freight service between Istanbul and Ankara. International routes are to Nicosia and Beirut.
Head Office: Ankara, Turkey.
Executives: H. Unsal, general manager; H. Yegin, technical director; S. Iscen, operations director; T. Sayar, accounts director; C. Ozcivelek, commercial director.
Fleet: 24 DC-3, seven Heron, one Viscount. On order: four Viscount.

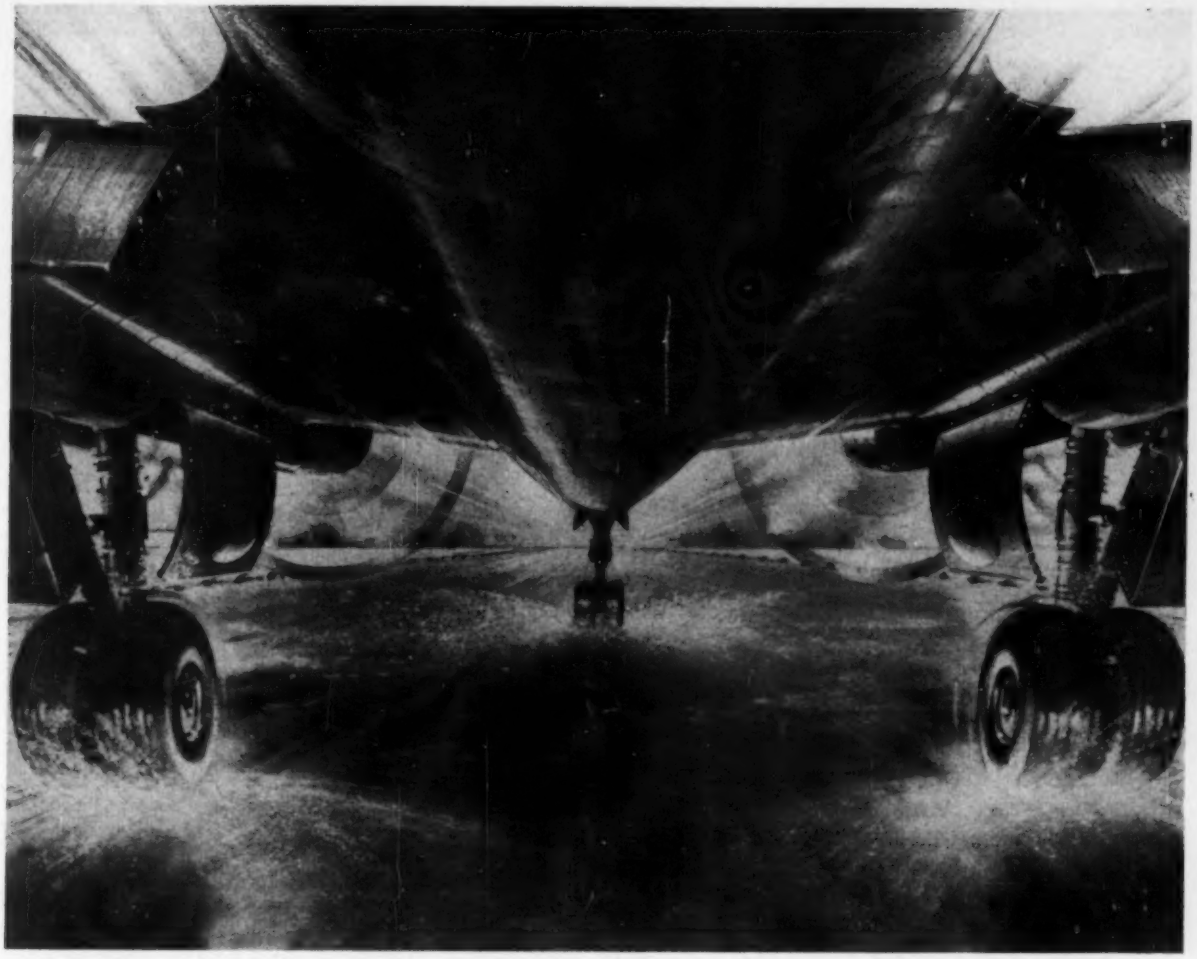
U.A.T.—see Union Aéromaritime de Transport.

Ukamps, the North Korean airline, is successor to Sokao, the Soviet-North Korean airline, which was founded in 1950 to connect North Korea with Aeroflot's services to and from Moscow. Services were suspended when North Korea invaded South Korea and operations were resumed in 1953.

Ukamps, described as Ministry of Communications of Korean Democratic People's Republic, now operates between Pyong-Yang and Mukden, and as part of the Aeroflot Moscow route, between Pyong-Yang and Chita.
Head Office: Pyong-Yang, Korean Democratic Republic.
Fleet: Li-2.

U.M.C.A.—see Uraba, Medellin and Central Airways, Inc.

Union Aéromaritime de Transport (U.A.T./Aéromaritime) was founded in 1949 and is connected with Cie. Maritime des Chargeurs Réunis. Services were opened to French Equatorial Africa and to Saigon. Comets were introduced in 1953, but subsequently withdrawn. Since January 1, 1955, U.A.T. has had the rights for the operation of all French services to Rhodesia, Mozambique and the Union of South Africa, and the company is operating between Paris and Johannesburg. U.A.T. also has 46 per cent of the traffic over the coastal routes



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WORLD AIRLINE DIRECTORY...

from France and North Africa to Senegal, French Guinea and the Ivory Coast. In Afrique Noire there is to be equal distribution of traffic between U.A.T. and Air France.

A U.A.T. subsidiary Aéromaritime, operates a network of feeder services in West Africa.
Head Office: Le Bourget, nr. Paris, France.
Executives: L. Vidal, president; J. Combard and R. Loubry, directors.
Fleet: seven DC-6A/B, one DC-4, eight Heron, five Noratlas. On order: two DC-6B, two DC-8 (1960), four Noratlas.

Union of Burma Airways was organized in 1948 with the Burmese Government subscribing 90 per cent of the capital. UBA operates domestic services and has international routes to Calcutta, East Pakistan, Thailand, Penang and Singapore.
Head Office: Rangoon, Burma.
Executives: U. Chit, chairman; U. Taw, general manager; B. G. Jones, engineering superintendent.
Fleet: ten DC-3, three Dove, two Marathon, one Convair PBY-5A, three Viscount 761.

United Air Lines, Inc., was organized on July 1, 1931, as a management company for Boeing Air Transport, Pacific Air Transport, National Air Transport and Varney Air Lines. These companies enable United to claim continuous operation back to 1926 when Varney began service. In 1933 United pioneered the use of the low-wing twin-engined metal monoplane when it introduced Boeing 247s on its coast to coast route, cutting the journey time to 19½ hr. U.A.L., Inc., became an operating company in its own right on May 1, 1934, following the Post Office mail contract fiasco.

In 1947 United opened a route from San Francisco to Honolulu and the company's present network extends from coast to coast over a number of routes. Hawaii is served from both San Francisco and Los Angeles.
Head Office: Chicago, Illinois, U.S.A.
Executives: W. A. Patterson, president; R. E. Johnson, asst. to president; J. A. Herlihy, vice-president engineering and maintenance; D. R. Petty, vice-president flight operations; C. Barkes, vice-president finance and property; S. P. Martin, secretary; A. M. de Vournsey, treasurer.
Fleet: 48 DC-7, 37 DC-6B, 42 DC-6, 53 Convair 340, five DC-6A. On order: eight DC-7, four DC-6B, two DC-6A, 11 Boeing 720, 40 DC-8.

United Helicopters, Ltd.—see Okanagan Helicopters, Ltd.

United States Overseas Airlines, Inc., concentrates on transatlantic charter freight flights.
Head Office: Wildwood, N.J., U.S.A.
Executives: R. W. Cox, president; R. L. McSweeney, secretary.
Fleet: nine C-54. On order: 2 L.1049H.

Uraba, Medellin and Central Airways, Inc.—UMCA operates Convair 240s thrice weekly between Balbao and Medellin. UMCA was founded in 1931, as a Pan American World Airways' subsidiary and operates its services with aircraft leased from P.A.W.A.
Head Office: Medellin, Colombia.
Executives: E. Balluder, president; R. G. Ferguson, treasurer; J. A. Mannion, secretary.
Fleet: Convair 240 leased from P.A.W.A.

VARIG—see S.A. Empresa de Viação Aérea Rio Grandense.

VASP—see Viacao Aerea Sao Paulo, S.A.

Vestlandske Luftfartselskap A/S. (West-Norway Airlines) was founded, mainly by Bergen shipping interests, as a private company in 1947. Considerable charter work and ambulance flying is done, and since 1951 V.L.S. has operated scheduled flying-boat services over three routes, Bergen - Alesund - Molde - Kristiansund - Trondheim, Bergen - Haugesund - Stavanger and Stavanger - Bergen - Trondheim.

Vestlandske is at present being liquidated, its routes being taken over by Braathens.
Head Office: Bergen, Norway.
Executives: S. Liby, managing director; A. Wagner Larsen, chief engineer; R. F. Rasmussen, chief pilot.
Fleet: one Heron 2, two Sealand, two Seabee.

Viacao Aerea Sao Paulo, S.A.—VASP, was founded in 1934 and began scheduled operations in 1935. Most of the company's stock is held by the Sao Paulo city, State and Municipal Bank. The company operates over more than 7,000 miles of domestic routes.
Head Office: Sao Paulo, Brazil.
Executives: Col. Oswaldo Pinto, president; J. Castilho Cabral, vice-president.
Fleet: 15 DC-3, nine Scandia, one Beechcraft. On order: five Viscount.

Vias Internas Orientalis has recently been established to operate internal services from Quito down to points east of the Andes.
Head Office: Quito, Ecuador.
Fleet: three Cessna.

West African Airways Corporation, an associate of B.O.A.C., was founded in 1946 by the West African territories of Nigeria, Gold Coast (now Ghana), Sierra Leone and the Gambia. Most of the company's network is in Nigeria but services extend as far west as Dakar and the unduplicated route mileage is about 7,500. The corporation's services are increasingly being turned over to DC-3s.
Head Office: Lagos, Nigeria.
Executives: R. W. C. Baker-Beall, chairman; D. Malcolm Brown, general manager; R. R. R. Allen, chief engineer; A. A. Cooper, secretary/chief accountant; Capt. A. L. Greenacre, chief pilot; J. P. S. Bailey, traffic manager.
Fleet: eight Heron, two Dove, five DC-3.

West Coast Airlines, Inc., was founded in 1941 under the laws of the State of Washington for the operation of passenger, mail and express services in the Pacific Coast area, but the C.A.B. held the application over until after the war and only granted certificates in 1946. The company took over Empire Air Lines in 1952 and now operates 2,000 miles of routes in Washington, Oregon and Idaho.
Head Office: Seattle, Washington, U.S.A.
Executives: N. Bez, president; G. Hamilton Beasley, executive vice-president; R. A. Duwe, secretary/treasurer; E. B. Code, vice-president operations; T. Croson, vice-president sales.
Fleet: 14 DC-3. On order: six Friendship (1958).

West Coast Airways, is a new operator flying scheduled services between Hokitika and Franz Josef Glacier, Fox Glacier, Haast and Milford Sound. The Haast - Milford Sound sector is only operated on request.
Head Office: Hokitika, New Zealand.
Fleet: D.H.89.

Western Airlines, Inc., claims to be the United States' oldest airline, having been founded in 1925 as Western Air Express. On April 17, 1926, air mail services were begun between Los Angeles and Las Vegas and Salt Lake City and on May 23 that year the first passengers were carried over the route. Western Air Express was part of the original TWA when it was formed in 1930 but Western regained its independence in 1934. The present name was legally adopted on March 11, 1941. WAL now operates 6,350 miles of routes in the Western and mid-West states. One route extends across the Canadian border to Edmonton.
Head Office: Los Angeles, Cal., U.S.A.
Executives: T. C. Drinkwater, president; P. E. Sullivan, vice-president/secretary; J. J. Taylor, vice-president/treasurer; S. R. Shatto, vice-president operations; M. W. Landes, vice-president service.
Fleet: 16 DC-6B, nine Convair 240, three DC-4, five DC-3. On order: nine Electra (1959/60).

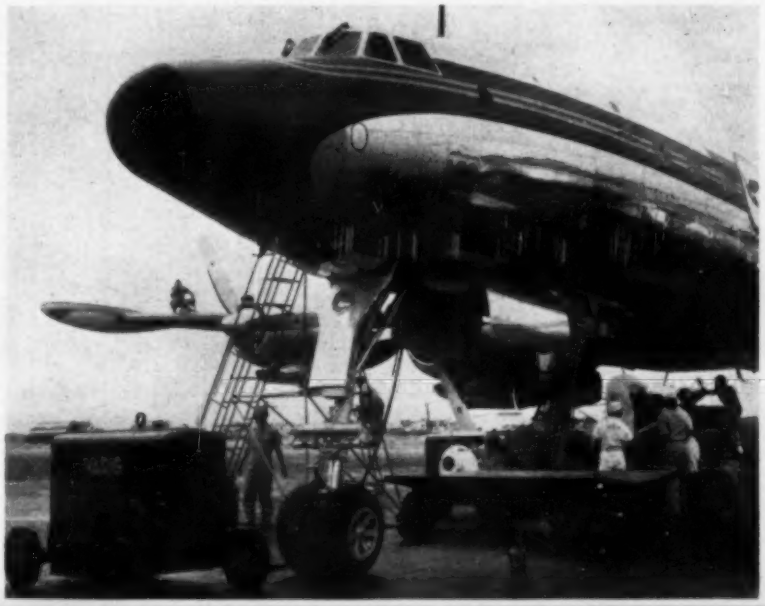
Wheeler Airlines, Ltd., is Canada's oldest airline, having been founded in 1921. The company is mostly engaged in non-scheduled operations but maintains a Beech 18-operated service on weekdays between St. Jovite and Montreal.
Head Office: St. Jovite, P.Q., Canada.
Executives: F. H. Wheeler, president; R. Rychlicki, managing director; J. Bancroft, treasurer; G. Fitzgerald, secretary.
Fleet: includes DC-4, C-46, Canso, Norseman, Beaver, Anson 5, Cessna 180 and 195, Boeing 75 (for crop spraying).

Widerøe's Flyveselskap og Polarfly A/S. is an old-established company engaging in many forms of air activity including charter flying and air survey. Widerøe's operated various pioneer air services around the Norwegian coast before the war, and for several years since the war the company has been operating the north Norway services for S.A.S. Routes, flown in summer, are Bodö - Tromsö, Bodö - Narvik, Tromsö - Andsvann and Tromsö - Vadsö.
Head Office: Oslo, Norway.
Executives: V. Widerøe, general manager.
Fleet: four Otter and six Norseman on scheduled services and two Lockheed 12A, two Seabee, one Cessna 170, one Piper Cub.

Wien Alaska Airlines, Inc., operates an extensive network of passenger, freight and mail services throughout most of Alaska. Operations are concentrated in the Fairbanks area with longer routes stretching to Nome in the west and Point Barrow on the north coast. The company has operated under its present title since 1936. Previously it had operated since 1929 as Northern Air Transport; its original operations began in 1924.
Head Office: Fairbanks, Alaska.
Executives: S. Wien, president; G. B. Rayburn, executive vice-president and treasurer; F. Wien, vice-president operations; A. E. Hagberg, vice-president traffic; R. M. King, secretary.
Fleet: four Curtiss C-46, three DC-3, five Norseman, 12 Cessna (types 170, 180, 195).

Woods Airways Pty., Ltd., was founded in 1947 and began scheduled operations in July 1948. The company's only route is that between Perth and Rottnest Island—a distance of 26 miles. Twelve services are flown in each direction every week and extra services are operated on demand.
Head Office: Perth, W. Australia.
Executives: Capt. J. Wood, managing director; G. L. S. Williams, secretary.
Fleet: two Anson.

Varig is another operator of Lockheed L.1049Gs, used on its international services.



Airline Scheduled Traffic

A FLIGHT COMPILATION

THOSE whose business necessitates the study of airline statistics frequently find themselves handicapped by out-of-date records and by the variety of ways in which data are presented. The tables in these pages have been compiled by "Flight" from the latest available figures and are presented in the manner employed by the International Civil Aviation Organization. (It may be added that the normal delay in the publication of I.C.A.O. statistics reflects the trouble which the Organization takes in checking the many inconsistencies in the basic material provided by the airlines.) The majority of the statistics in the following tables relate to 1957. Where no information has been forthcoming we have in most instances—denoted by an asterisk—given 1956 statistics from the I.C.A.O. "Traffic Digest."

State and Carrier	Miles flown ×1,000	Hours flown	Pass. carried	Pass.-miles ×1,000	Seat-miles ×1,000	Seat L.F. %	Load ton-miles: Pass. ×1,000	Load ton-miles: E. Bag. ×1,000	Load ton-miles: Freight ×1,000	Load ton-miles: Mail ×1,000	Load ton-miles: Total ×1,000	Capacity ton-miles ×1,000	Wt. L.F. %
NORTH AMERICA													
Canada:													
C.P.A.L.	13,329	—	279,916	317,998	—	—	—	—	6,097	1,276	—	—	—
Mar. Central	802	5,425	38,701	6,702	19,389	35	670	17	368	106	1,161	1,939	60
Matane	277	2,068	26,323	1,584	—	—	—	—	—	—	—	—	—
Pac. West	1,882	14,892	112,291	13,514	17,902	75	1,351	24	54	24	1,453	1,834	79
Quebecair*	1,033	7,320	126,501	10,807	28,592	38	—	43	—	326	—	3,183	—
Transair*	440	4,034	8,132	1,114	—	—	—	1	58	22	—	—	—
T.C.A.	44,125	196,027	2,387,710	1,381,883	1,955,936	71	123,217	872	14,035	8,941	147,065	247,298	59
U.S. Domestic Trunks and International:													
American	142,900	587,318	8,108,437	5,135,532	7,917,517	65	488,568	6,043	94,926	20,085	609,622	1,054,118	58
Braniff	37,178	—	2,038,656	956,964	1,648,898	58	—	—	7,368	3,490	—	—	47
Capital	—	—	3,949,844	1,513,022	—	59	—	—	6,496	5,168	157,104	—	47
Continental	14,990	77,330	828,323	363,097	673,771	54	34,494	367	2,018	1,083	37,962	85,060	45
Delta	43,735	—	2,713,000	1,400,000	2,300,000	60	152,867	—	12 490	4,333	169,690	278,662	55
Eastern	—	—	—	4,821,136	—	60	—	—	22,064	12,263	503,673	—	47
National	25,110	111,932	1,420,399	946,820	1,609,240	59	90,284	1,976	6,221	3,337	101,818	203,581	50
Northeast	10,777	59,115	763,617	245,182	517,730	47	23,379	190	894	517	24,980	62,016	40
Northwest	—	—	—	1,205,765	—	57	—	—	19,714	17,054	155,809	—	55
PanAm.	97,321	384,575	2,784,521	3,589,883	5,497,557	64	353,607	8,716	94,769	36,512	493,604	785,404	63
Panagra	5,412	21,326	136,328	168,641	292,946	58	17,543	681	4,461	1,160	23,845	39,782	60
T.W.A.	117,873	502,360	4,802,000	4,356,343	6,938,691	63	418,326	4,401	41,570	24,055	488,352	855,150	57
United	130,370	515,560	6,648,000	4,868,307	7,536,986	65	469,134	—	67,002	29,754	565,890	1,000,733	57
Western	—	—	1,379,653	701,641	—	53	—	—	4,025	3,091	74,468	—	54
U.S. Local Service:													
Allegheny	6,389	45,152	456,148	77,011	160,891	48	7,300	35	171	101	7,607	17,681	44
Bonanza	—	—	150,423	32,023	—	45	—	—	102	51	3,312	—	44
Central	3,293	22,833	116,987	23,244	69,713	33	2,208	20	113	50	2,391	7,967	30
Frontier	—	—	219,360	57,620	—	51	—	—	837	215	6,747	—	60
Lake Central	2,781	20,218	160,784	25,549	—	44	2,432	16	—	33	2,481	—	—
Mohawk	5,171	33,475	481,431	79,587	166,009	48	7,561	36	250	72	7,919	16,601	49
N. Central	9,496	—	680,930	100,744	221,914	45	10,146	77	364	255	10,842	—	—
Ozark	6,119	43,682	396,164	62,941	152,973	41	5,979	39	350	134	6,502	15,083	43
Piedmont	7,329	50,498	433,554	82,656	153,905	54	7,852	68	283	161	8,364	15,684	53
Southern	3,850	26,391	215,113	37,512	100,102	37	3,564	32	132	115	3,843	9,835	39
S'West (now Pacific)	4,313	27,178	319,276	70,000	124,399	56	6,650	24	134	114	6,922	13,396	52
Trans Texas	—	—	226,501	15,801	—	54	—	—	378	166	5,823	—	39
West Coast	4,005	29,858	249,668	44,719	84,111	53	4,248	20	86	52	4,406	9,613	46
U.S. Territorial:													
Caribbean	—	—	226,501	15,801	—	54	—	—	39	18	1,742	—	59
Hawaiian	2,990	17,726	440,960	61,829	105,738	58	5,125	24	1,409	51	6,609	11,731	56
Trans Pacific	—	—	180,168	27,661	—	57	—	—	127	15	2,334	—	58
U.S. Cargo:													
Aaxico	734	4,051	—	—	—	—	—	172	2,335	30	2,537	4,634	55
A.S.A.	1,848	9,048	—	—	—	—	—	—	8,416	—	—	10,397	81
Flying Tiger	—	—	—	—	—	—	—	—	58,551	—	—	—	—
Slick	—	—	—	—	—	—	—	—	50,519	846	83,268	—	77
Riddle	6,477	35,189	—	—	—	—	—	—	31,195	511	31,706	45,364	68
Seaboard	—	—	—	—	—	—	—	—	17,939	—	44,129	—	75
U.S. Helicopter:													
New York	464	8,084	68,060	1,258	3,267	38	120	1	18	19	158	382	41
Los Angeles	570	8,248	30,095	1,121	2,183	51	107	1	22	46	176	300	59
Chicago	569	8,988	55,310	895	2,599	34	85	1	—	26	111.5	368	30
U.S. Alaska:													
Alaska	2,303	14,714	41,404	17,672	64,320	28	1,773	42	2,606	592	5,013	12,181	41
Alaska Coast	—	—	51,841	4,411	—	64	—	—	48	48	569	—	65
Cordova	—	—	19,738	5,135	—	55	—	—	1,439	43	1,996	—	49
Ellis	845	7,392	63,168	3,383	5,117	61	305	5	30	24	364	512	71
N. Consol.	1,269	9,369	17,947	5,999	13,717	44	630	29	682	277	1,618	2,640	61
Pac. North	3,911	17,846	123,848	105,035	198,931	53	11,243	136	2,971	1,121	15,471	25,414	61
Reeve	—	—	—	6,285	—	—	—	—	—	—	—	—	—
Wien	1,582	11,925	25,095	7,863	19,554	40	786	34	468	399	1,687	2,770	61

* 1956 data (see introductory note above)

Marconi's hand in Airport Radar

Planning and Installation of Military and Civil Radar Systems

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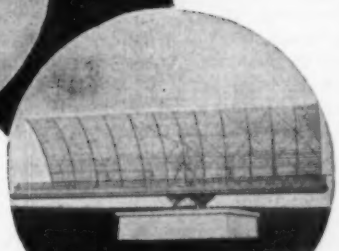
TYPE SNW 51 3 cm STORM WARNING RADAR

Storm Warning Radar can now be recognised as an important element of an Airport Radar system. The SNW 51 provides an accurate and up-to-the-moment picture of the movement of storm centres and areas of precipitation over ranges up to 200 n. miles. Remote displays, static or mobile versions are available.



TYPE S264

TYPE S 264 AIRFIELD CONTROL RADAR

has been specifically designed for civil air traffic control and is not a modified military type. It operates at full efficiency in all weathers because the wavelength is long enough to penetrate cloud. Ground clutter which obscures aircraft response is removed by means of an extremely effective M.T.I., thus rendering identification procedure unnecessary. The equipment is instantly operational at its rated performance because it is crystal controlled and needs no adjustment after switching on. The S 264 is suitable for monitoring aircraft on airways at the approach to the control zone, controlling them in the stacks and feeding them on to ILS or PAR, providing limited P.P.I. controlled approach to runways and taking control of outbound aircraft as soon as they are airborne.

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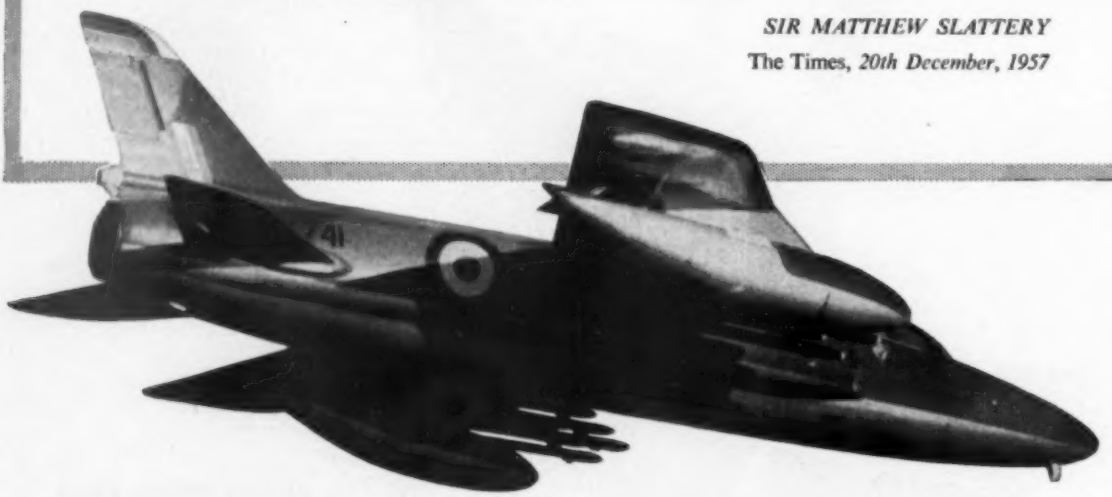
THE WEAPON ON THE SPOT . . .

"Few, if any, can be found among knowledgeable and responsible people who really believe that missiles can replace the manned military aircraft as early as is postulated."

SIR MATTHEW SLATTERY
The Times, *20th December, 1957*



The guided missile is indeed the 'ultimate' weapon—the *last* weapon to be used or considered. That is why considered strategic thinking supports the use of more conventional weapons in the first instance; but they must be swift in execution to fulfil their object—the rapid resolution of local conflicts which could so easily spread and bring the ultimate weapon into operation. An Air Force that is flexible as well as effective is the best means of fulfilling that object.

The Folland GNAT, as the fighter component of such an Air Force, is a sound economic proposition. For it has reversed the trend to greater size, complexity and cost in more conventional fighter design. Compared with any conventional fighter, it has better manoeuvrability, a greater operating height and the most advanced armament and equipment; its simplicity makes little demand on skilled maintenance. As a strategic or tactical fighter of the first rank, the GNAT is the right aircraft, for the right job, at the right time.

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Airline Scheduled Traffic . . .

A **FLIGHT** COMPILATION

State and Carrier	Miles flown ×1,000	Hours flown	Pass. carried	Pass.-miles ×1,000	Seat-miles ×1,000	Seat L.F. %	Load ton-miles: Pass. ×1,000	E. Bag. ×1,000	Freight ×1,000	Mail ×1,000	Total ×1,000	Capacity ton-miles ×1,000	Wt. L.F. %
SOUTH AMERICA													
Argentina:													
Argentinas*	11,839	68,370	440,044	260,350	392,194	66	26,852	676	2,841	1,264	31,633	46,038	68
L.A.D.E.*	695	3,722	21,335	12,406	17,152	72	1,054	15	6	2	1,077	1,586	68
Bolivia:													
L.A.B.	2,278	15,703	95,723	20,723	—	—	2,074	74	3,403	8	5,559		
Brazil:													
Cruzeiro*	11,222	66,596	412,684	158,301	327,232	48	13,079	249	5,860	168	19,356	31,510	61
P.A.B.*	12,150	67,777	335,867	247,488	429,865	58	24,236	561	4,670	1,395	30,862	60,862	51
VARIG	11,265	65,115	497,038	—	—	50	21,223		9,169	359	30,751	46,895	66
VASP	6,581	41,398	445,839	—	—	56.23	9,464		1,619	8	11,191	18,111	61.64
Chile:													
LAN*	5,242	31,209	264,553	131,009	188,994	69	12,805	421	1,417	99	14,742	22,247	66
Colombia:													
AVIANCA	14,233	82,449	1,083	—	—	65		—	—	—	52,305		63
RAS*	1,292	8,047	102,253	20,367	52,421	39	1,854	26	18	11	1,909	5,475	35
UMCA*	98	567	1,753	573	4,349	13	59	3	76	—	138	492	28
Uruguay:													
PLUNA*	1,583	11,210	93,532	20,949	36,333	58	1,995	45	66	2	2,108	3,506	60
Venezuela:													
AVENSA	4,274	28,305	332,515	—	—	—	6,375	166	2,139	—	8,680	18,590	
Taca de Venez*	2,865	23,301	144,330	19,487	67,212	29	2,148	—	548	—	2,696	6,095	44
L.A.V.*	7,671	44,910	245,788	118,810	249,468	48	10,459	—	5,528	—	16,540	36,512	45
CENTRAL AMERICA													
British West Indies:													
B.W.I.A.	1,844	9,981	105,902	40,345	58,181	69	4,465	141	256	168	5,030	8,087	62
Cuba:													
Aerovias Q	568	3,798	127,359	13,254	26,197	51	1,461	—	48	9	1,518	4,183	—
Cubana	164,688		325,243	—	—	60	—	—	953	151	—	—	—
Mexico:													
C.M.A.	13,779	74,591	554,502	—	—	65	33,873	229	10,654	601	45,357	—	59
Guest*	1,542	6,021	36,632	50,127	103,335	49	5,414	192	360	38	6,004	12,427	48
EUROPE													
Azores:													
Acoriana*	129	771	6,678	726	1,140	64	71	3	5	7	86	106	81
Belgium:													
Sabena	21,865	110,899	615,716	577,016	1,009,845	57	59,563	576	17,901	4,503	82,543	119,805	69
Denmark:													
S.A.S. *see Scand.*													
Finland:													
Aero O/Y	5,775	35,200	385,147	100,558	191,263	52	9,453	68	806	297	10,714	21,508	48
Kar-Air	413	2,618	24,610	4,465	9,592	45	407	—	16	5	428	1,007	—
France:													
Air France	47,875	228,799	2,385,640	1,861,421	2,716,954	68	148,002	39,835	42,100	15,140	245,077	362,000	68
T.A.I.	6,179	26,578	62,751	194,577	333,633	58	20,418	—	4,550	1,488	26,456	41,584	64
U.A.T.	7,117	33,396	130,186	189,088	317,550	59	19,278	—	10,708	1,259	31,245	44,520	70
Germany (West):													
Lufthansa	9,924	51,740	380,862	303,255	530,846	57	30,373	364	4,464	2,869	38,070	71,568	53
Greece:													
Olympic	2,590	15,563	207,714	52,759	92,541	57	5,086	92	518	124	5,820	10,860	53
Iceland:													
Flugfelag*	1,333	7,921	67,264	21,812	43,366	50	2,071	44	467	73	2,655	4,918	54
Loftleidir	2,180	11,137	24,919	71,532	124,410	57	5,937	1,385	508	61	7,891	13,931	57
Ireland:													
Aer Lingus	3,858	25,413	420,560	104,734	145,941	72	9,081	67	1,097	307	10,552	16,175	65
Italy:													
Alitalia-L.A.I.*	11,442	55,698	385,621	266,292	500,006	53	27,575	536	4,209	2,012	34,333	59,738	57
Jugoslavia:													
J.A.T.	1,916	11,520	109,332	31,658	—	—	2,860	45	225	180	3,310	5,100	65
Netherlands:													
K.L.M.	41,694	187,000	890,000	1,240,440	2,084,758	60	126,508	—	47,261	7,123	180,892	303,428	59
Norway:													
Braathens	897	6,072	53,105	10,033	20,401	49	895	—	26	32	953	1,908	50
S.A.S.—*see Scand.*													
Westlandske*	276	2,101	11,141	1,533	2,917	53	141	—	1	6	148	307	48
Wideroes*	72	775	2,581	301	432	70	30	—	1	3	34	43	79
Poland:													
LOT	—	22,743	217,027	62	82	76	5	0.5	0.5	0.5	6.5	9	72
Portugal:													
T.A.P.	1,985	8,856	47,087	55,058	98,268	56	5,688	64	415	588	6,755	14,031	48
Scandinavia:													
S.A.S.	34,851	150,649	1,450,344	1,023,169	1,835,184	56	101,291	1,360	17,188	6,983	126,822	254,139	50
Spain:													
A.Y.C.	2,478	14,429	205,155	48,133	72,028	67	4,775	30	218	350	5,373	8,109	66
Iberia	10,953	60,432	749,042	299,645	470,490	64	—	—	1,402	705	—	—	—
Sweden:													
Linjeflyg	1,326	8,656	59,516	10,995	21,660	51	1,065	2	853	6	1,926	3,243	59
S.A.S.—*see Scand.*													
Switzerland:													
Swissair	17,893	72,713	985,216	543,094	879,720	62	56,395	—	10,747	3,726	70,868	114,957	62
United Kingdom:													
B.E.A.	32,425	187,589	2,751,721	926,010	1,317,400	70	86,785	—	9,747	3,593	100,125	155,354	64
B.O.A.C.	40,175	170,232	459,829	1,320,398	2,028,267	65	131,512	2,046	35,372	20,276	189,206	304,189	62
Air Charter	575	6,182	42,063	3,489	9,072	30	351	1,276	193	—	1,820	2,942	53
Airviews	49	300	780	320	400	90	—	—	—	—	—	25	90
Airwork	1,249	6,572	7,008	25,010	33,700	74	—	—	—	—	—	—	—
B.A.S.	2,509	19,713	343,133	44,878	73,251	66	4,567	15	2,971	21	7,574	11,355	67
B.K.S.	611	4,127	46,403	13,821	22,183	63	1,155	—	27	—	—	—	—
Cambrian	1,420	9,130	57,765	12,980	19,044	68	—	—	—	—	—	—	—
Channel	5,438	4,500	29,880	540	838	64	505	—	—	—	505	764	66
Derby	932	6,320	40,844	16,689	26,509	63	1,640	—	—	—	1,640	2,562	64
Eagle	426	2,369	16,317	6,220	15,238	41	613	—	17	1	631	1,518	42
Hunting Clan	2,340	12,181	7,973	30,284	41,794	72	2,518	—	3,510	—	6,028	9,808	61
Scottish	44,620	395	11,862	1,151	1,613	63	101	—	—	—	101	152	59

* 1957 figure not available, I.C.A.O. data for 1956 shown.

[Cont. overleaf

AIRLINE SCHEDULED TRAFFIC . . .

State and Carrier	Miles flown ×1,000	Hours flown	Pass. carried	Pass.-miles ×1,000	Seat-miles ×1,000	Seat L.F. %	Load ton-miles: Pass. ×1,000	E. Bag. ×1,000	Freight ×1,000	Mail ×1,000	Total ×1,000	Capacity ton-miles ×1,000	Wt. L.F. %
AFRICA													
Algeria:													
Air Algerie*	3,204	16,522	221,498	128,519	186,718	69	13,462	—	1,769	421	15,653	19,557	80
Angola:													
D.T.A.*	1,155	7,878	31,064	9,516	16,162	59	1,014	11	122	43	1,190	1,796	66
S.T.A.*	25	265	728	77	116	67	6	—	1	—	7	10	65
Belgian Congo:													
Sabelair	124	716	967	—	—	—	—	—	—	—	—	—	—
Brit. E. Africa:													
E.A.A.C.	2,958	20,406	114,182	38,855	83,917	46	3,713	38	1,050	251	5,052	9,589	53
Caspair	108	829	1,848	333	—	—	—	—	—	—	—	—	—
Cent. Africa:													
C.A.A.C.	5,141	29,046	174,991	100,697	160,118	63	9,350	—	861	400	10,612	17,627	—
Hunting-Clan	384	2,896	12,608	2,777	—	—	—	—	—	—	486	956	—
Ethiopia:													
E.A.L.	2,878	15,227	86,055	38,674	78,913	—	3,661	158	1,763	148	5,730	10,558	54
Egypt:													
Misrair	2,075	11,421	91,856	40,159	65,492	61	4,117	108	623	59	4,907	7,204	68
Morocco:													
Air Maroc*	2,064	12,644	108,787	78,904	108,697	73	7,155	—	723	451	8,328	10,881	77
Mozambique:													
D.E.T.A.*	1,260	8,306	21,988	9,262	17,159	54	929	15	154	56	1,154	2,521	46
Nigeria:													
W.A.A.C.*	1,960	13,197	61,476	17,272	31,076	56	1,792	—	288	155	2,236	3,558	63
South Africa:													
S.A.A.	7,660	35,650	302,602	250,736	397,101	65	24,302	200	3,983	2,932	31,417	53,636	58
Sudan:													
Sudan-Air†	1,151	7,231	24,564	11,007	—	—	945	28	306	36	1,315	2,282	—
Tunisia:													
TunisAir*	1,133	6,888	98,527	39,686	57,001	67	3,834	—	282	123	4,239	5,758	74
MIDDLE EAST													
Aden:													
Aden Air.*	1,409	8,832	32,136	13,595	24,269	56	1,347	53	1,097	116	2,614	4,514	58
Cyprus:													
Cyprus Air.	807	4,431	35,832	16,738	28,507	59	1,606	29	343	221	2,199	3,326	66
Iran:													
Iranair‡	2,138	9,552	48,475	19,216	42,701	45	1,695	21	394	32	2,141	4,740	45
Iraq:													
Iraqi*	1,107	5,270	53,684	20,578	40,626	51	1,961	54	209	38	2,262	4,573	49
Israel:													
Arkia	468	3,772	65,977	12,074	14,969	81	103	11	68	2	184	12,863	86
El Al	—	12,909	43,600	91,142	136,981	65	8,201	251	1,693	425	10,570	15,862	68
Jordan:													
Arab Air.§	775	4,883	25,827	9,659	19,627	49	785	19	124	11	939	2,177	52
Lebanon:													
Air Liban	1,933	10,866	57,433	41,286	102,559	40	3,276	1,034	1,333	42	5,685	11,384	50
Leb Internat.*	378	2,280	6,804	5,897	18,896	31	464	—	931	5	1,401	2,134	66
M.E.A.	2,924	14,758	79,561	57,382	115,630	50	5,842	253	1,350	114	7,559	14,159	53
Turkey:													
T.H.Y.	4,367	28,176	327,649	80,101	98,143	82	7,239	97	492	77	7,905	11,657	68
ASIA:													
Burma:													
U.B.A.††	2,154	16,166	149,933	38,075	55,731	68	3,097	155	700	49	4,021	6,136	65
Ceylon:													
Air Ceylon*	1,153	6,323	30,951	18,280	44,240	41	1,730	38	840	90	2,698	5,542	49
Formosa:													
C.A.T.*	1,411	8,112	54,198	25,680	59,233	43	2,512	155	755	257	3,779	6,765	56
Foshing	239	1,632	61,137	6,178	8,618	72	1,022	3	136	15	1,176	1,483	79
Hong Kong:													
Cathay Pac.	1,642	7,804	41,653	49,969	86,221	58	4,764	—	830	393	5,987	8,383	71
Hong Kong	618	2,701	17,619	15,950	26,408	60	1,532	73	82	13	1,700	2,811	60
India:													
Air-India	6,503	25,517	87,109	245,517	380,921	65	24,068	534	5,910	3,008	33,520	54,168	62
I.A.C.*	17,756	113,910	485,156	216,968	345,655	63	21,162	—	14,636	3,495	39,293	57,208	69
Indonesia:													
Garuda*	8,522	50,128	443,163	167,058	292,538	57	14,238	484	3,931	1,573	20,226	27,368	74
Japan:													
All Nippon*	2,162	16,592	115,998	26,292	39,421	67	1,963	—	43	112	2,118	3,496	61
J.A.L.	7,886	37,999	422,557	310,110	428,357	73	29,262	248	4,639	2,589	36,738	49,817	74
Malaya:													
Malayan*	3,152	24,199	155,471	36,062	60,034	60	3,577	—	1,143	194	4,914	7,486	66
Pakistan:													
P.I.A.	4,390	22,543	190,592	132,036	200,833	66	12,654	314	1,959	659	15,586	26,526	59
Thailand:													
Thai Airways	2,717	16,949	95,053	48,699	117,189	42	4,354	85	658	537	5,634	12,082	47
AUSTRALASIA/PACIFIC													
Australia:													
Ansett*	4,378	24,837	228,980	86,848	146,646	59	—	—	3,159	13	—	19,056	62
A.N.A.*	13,170	76,878	608,185	281,757	478,744	59	—	—	21,108	662	—	77,303	65
Butler	3,000	18,370	228,500	61,750	103,200	58	6,175	—	765	6	—	11,250	62
Connellan	367	3,077	1,683	217	—	37	—	—	—	—	—	—	—
East/West*	884	6,232	57,774	12,156	18,811	65	—	—	163	1	—	2,326	59
Guinea*	975	7,610	94,162	15,662	23,287	67	—	—	247	9	—	2,795	65
H.M.A.*	2,620	18,079	46,396	23,287	52,928	44	—	—	1,300	47	—	5,947	62
Qantas	12,956	56,455	137,388	412,161	656,159	63	43,031	878	11,307	9,175	—	110,921	58
Queensland	1,051	7,875	57,909	12,548	24,574	51	—	—	381	4	—	2,540	65
Southern*	175	1,429	3,170	427	1,559	27	—	—	1	—	—	112	40
T.A.A.	16,399	88,908	811,977	394,222	569,339	69	—	—	9,814	765	49,854	76,826	65
Woods*	22	212	4,213	110	154	71	—	—	—	—	—	17	65
New Caledonia:													
Transpac*	112	—	5,885	650	900	72	53	—	3	1	56	66	86
New Guinea:													
Carsair*	95	781	1,231	294	1,222	24	—	—	22	1	—	67	—
Gibbes-Sepik*	18	165	592	53	274	19	—	—	6	1	—	—	—
Mandated*	248	1,717	12,298	4,522	9,647	47	—	—	135	10	—	728	—
Papuan*	81	773	3,316	242	939	26	—	—	20	1	—	59	64
Qantas*	598	4,439	27,864	9,231	16,853	55	—	—	131	43	—	1,506	59
New Zealand:													
N.Z. National	6,958	—	478,532	119,392	157,543	76	—	150	2,721	248	—	—	75
S.A.F.E.*	438	2,953	1,141	85	147	58	9	—	1,973	—	1,982	2,534	78
T.E.A.L.	2,035	8,461	60,232	81,139	101,361	80	8,275	81	692	612	9,660	12,645	76
Trans Island*	52	487	1,720	183	357	51	18	—	2	1	21	37	55
West Coast*	7	71	168	18	47	38	2	—	1	1	31	5	64
Tahiti:													
R.A.I.*	30	—	2,770	417	665	63	43	—	5	1	49	86	57

* 1956 actual data. † July 1956–June 1957. ‡ 1955 estimated data. †† 1955 actual data. § April–December 1957.

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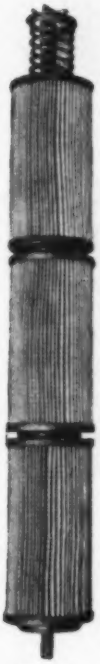

Fig. 1

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Fig. 2

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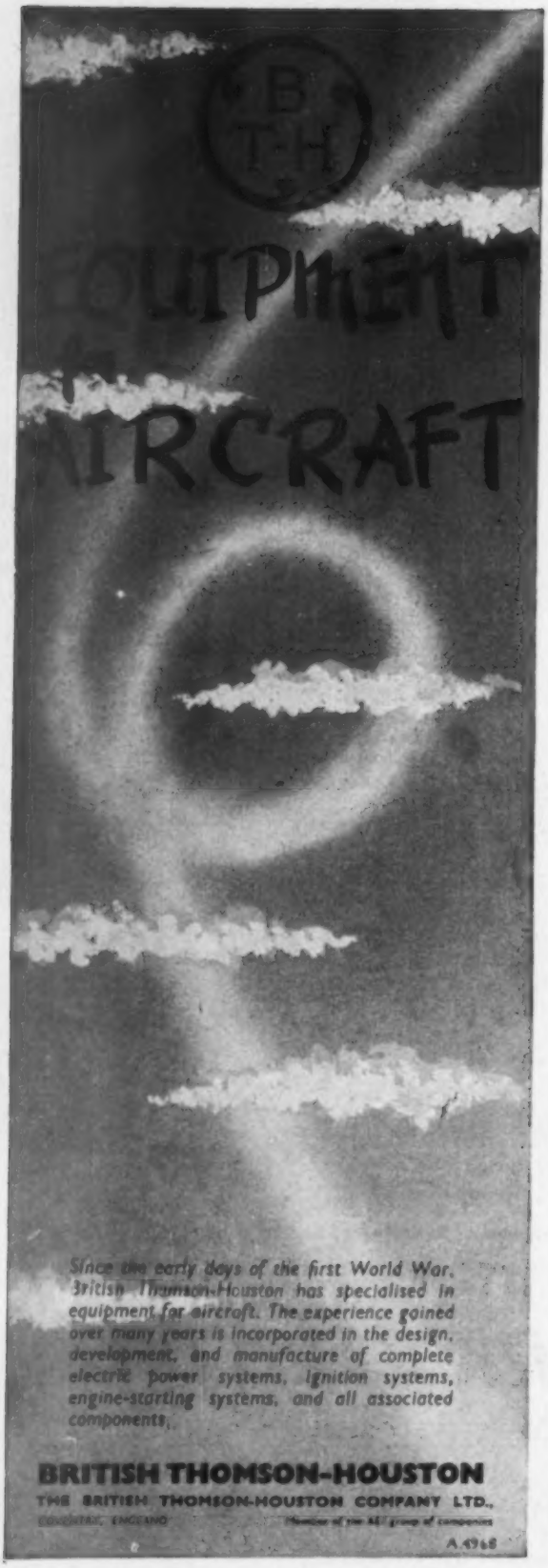

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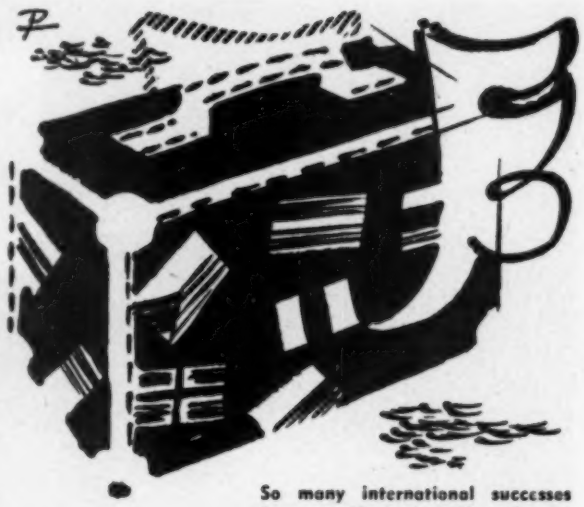

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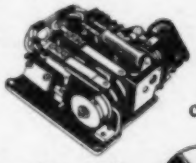
Time Switches—non-resetting, resetting and cycling, are widely used on many of to-day's aircraft for such applications as; gas turbine engine and rocket motor starting  inching mechanisms for power operated flying trim controls, camera gun operation, navigation light flashing units, civil and military; de-icing heater mat cycling units automatic bomb release switches and units designed to provide a fixed duration pulse at selectable intervals.

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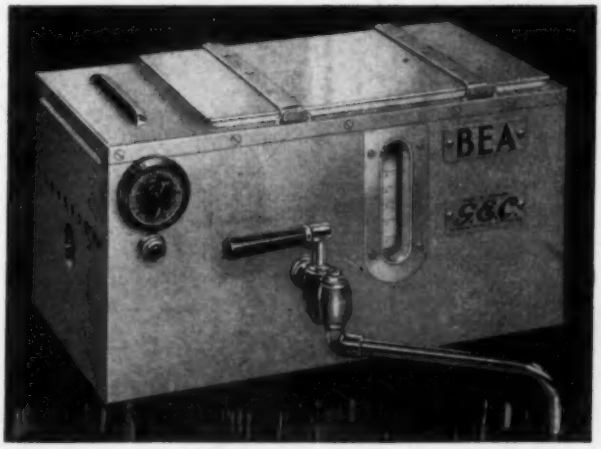

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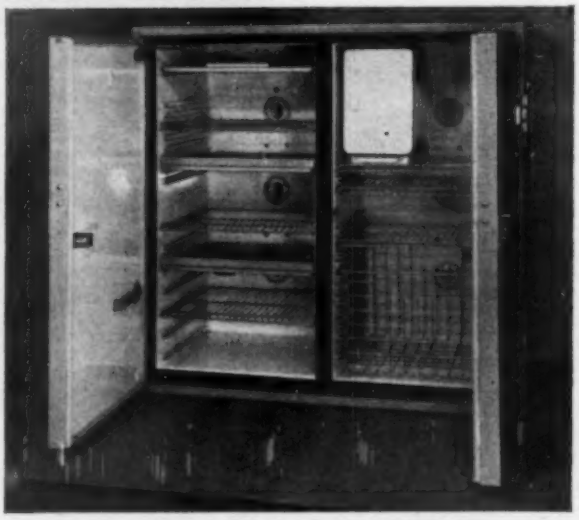

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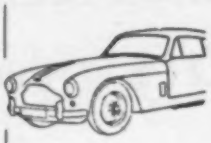

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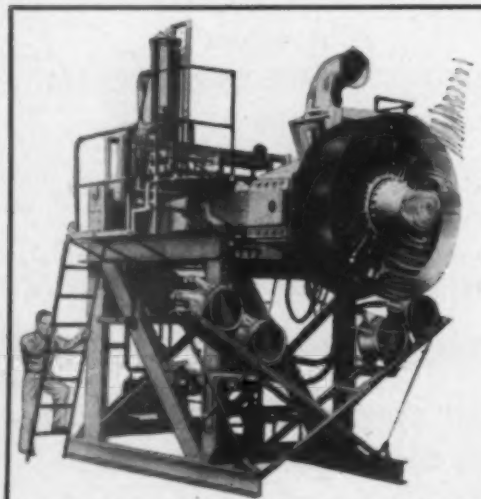

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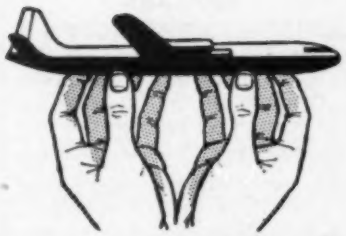

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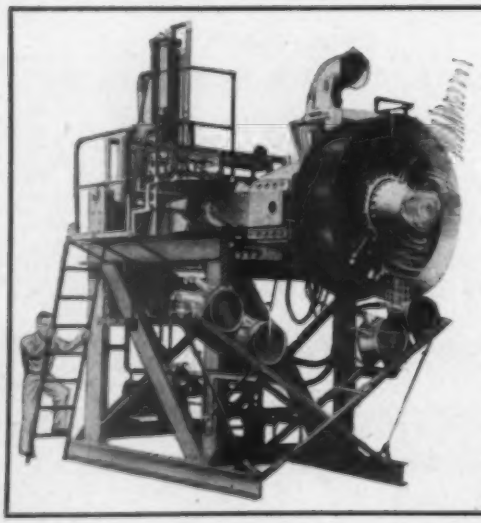

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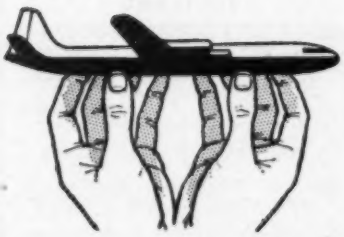

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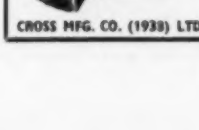

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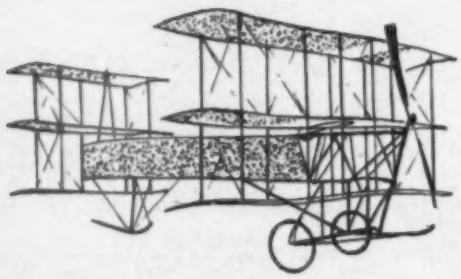

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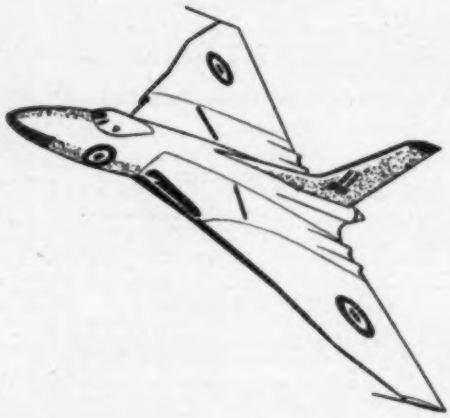

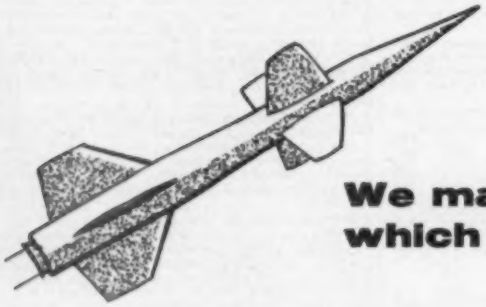

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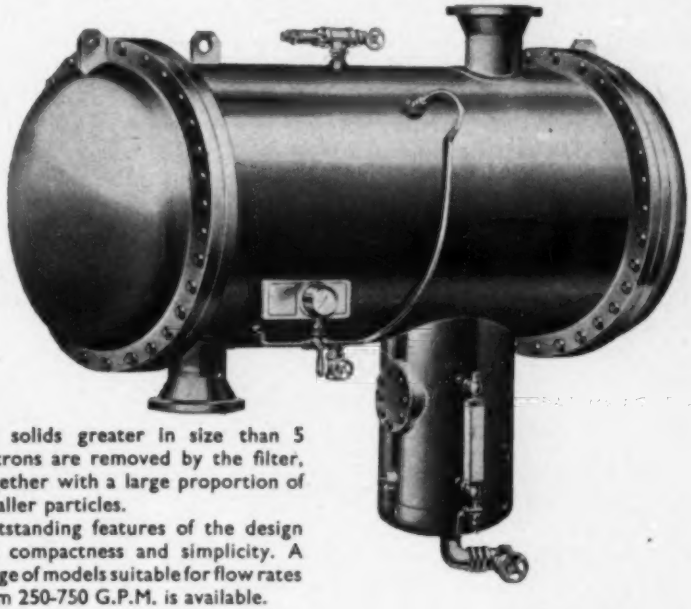

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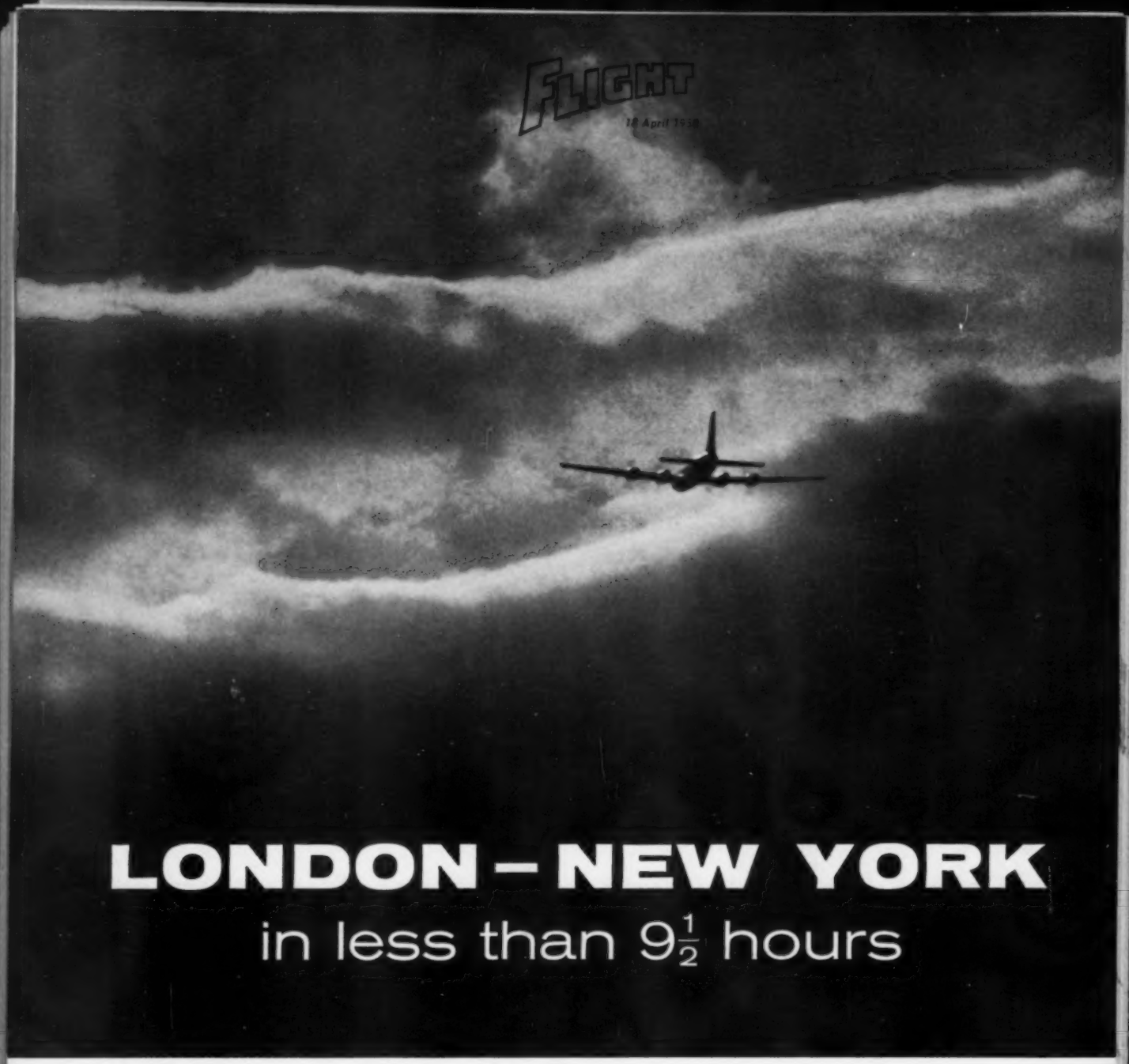

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